The Iron Age

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The Relations Between Science and Industry.

Sir Lyon Playfair, president of the British Association, in his presidential address at the Aberdeen meeting, spoke as follows of the relations between science and industry:

When we examine the order of progress in the arts, even before they are illumined by science, their improvements seem to be the resultants of three conditions:

1. The substitution of natural forces for brute animal power, as when Hercules used the waters of the Alpheus to cleanse the Augean stables, or when a Kamchadal of Eastern Asia, who has been three years hollowing out a canoe, finds that he can do it in a few hours by fire.

2. The economy of time, as when a calendering machine produces the same gloss to miles of calico that an African savage gives to a few inches by rubbing it with the shell of a snail; or the economy of production, as when steel pens, sold when first introduced at 1 shilling apiece, are now sold at 1 penny per dozen; or when steel rails, lately costing £45 per ton, can now be sold at £5.

3. Methods of utilizing waste products, or of endowing them with properties which render them of increased value to industry, as when waste scrap iron and the galls on the oak are converted into ink; or the badly-smelling waste of gas works is transformed into fragrant essences, brilliant dyes and fertilizing manure; or when the effete matter of animals or old bones is changed into lucifer matches.

All three results are often combined when a single end is obtained—at all events, economy of time and production invariably follows when natural forces substitute brute animal force. In industrial progress the sweat of the brow is lessened by the conceptions of the brain. How exultant is the old Greek poet, Antipater ("*Analecta Veterum Græcorum*," Epig 39, vol. ii., p. 119), when women are relieved of the drudgery of turning the grindstones for the daily supply of corn! "Women, you who have hitherto had to grind corn, let your arms rest for the future. It is no longer for you that the birds announce by their songs the dawn of the morning. Ceres has ordered the water nymphs to move the heavy millstones and perform your labor." Penelope had 12 slaves to grind corn for her small household. During the most prosperous time of Athens it was estimated that there were 20 slaves to each free citizen. Slaves are mere machines, and machines neither invent nor discover. The bondmen of the Jews, the helots of Sparta, the captive slaves of Rome, the serfs of Europe, and uneducated laborers of the present day, who are the slaves of ignorance, have added nothing to human progress. But as natural forces substitute and become cheaper than slave labor, liberty follows advancing civilization. Machines require educated superintendence. One shoe factory in Boston by its machines does the work of 30,000 shoemakers in Paris, who have still to go through the weary drudgery of mechanical labor. The steam-power of the world during the last 20 years has risen from 11,500,000 to 29,000,000 horse-power, or 125 per cent. Let me take a single example of how even a petty manufacture improved by the teachings of science affects the comforts and enlarges the resources of mankind.

When I was a boy the only way of obtaining a light was by the tinder-box, with its quadruple materials, flint and steel, burned rags or tinder, and a sulphur match. If everything went well, if the box could be found and the air was dry, a light could be obtained in two minutes; but very often the time occupied was much longer, and the process became a great trial to the serenity of temper. The consequence of this was that a fire or a burning lamp was kept alight through the day. Old Gerard, in his herbal, tells us how certain fungi were used to carry fire from one part of the country to the other. The tinder-box long held its position as a great discovery in the arts. The *pyridicula igniaria* of the Romans appears to have been much the same implement, though a little ruder than the flint and steel which Philip the Good put into the collar of the Golden Fleece in 1429 as the representation of high knowledge in the progress of the arts. It continued to prevail till 1833, when phosphorus matches were introduced, though I have been amused to find that there are a few venerable ancients in London who still stick to the tinder-box, and for whom a few shops keep a small supply. Phosphorus was no new discovery, for it had been obtained by an Arabian called Bechel in the eighth century. However, it was forgotten, and was rediscovered by Brandt, who made it out of very stinking materials in 1669. Other discoveries had, however, to be made before it could be used for lucifer matches. The science of combustion was only developed on the discovery of oxygen a century later. Time had to elapse before chemical analysis showed the kind of bodies which could be added to phosphorus so as to make it ignite readily. So it was not till 1833 that matches became a partial success. Intolerably bad they then were, dangerously inflammable, horribly poisonous to the makers, and injurious to the lungs of the consumers. It required another discovery by Schrötter in 1845 to change poisonous waxy into innocuous red-brick phosphorus in order that these defects might be remedied, and to give us the safety match of the present day. Now, what have these successive discoveries in science done for the nation, in this single manufacture, by an economy of time? If before 1833 we had made the same demands for light that we now do, when we daily consume eight matches per head of the population, the tinder-box could have supplied the demand under the most favorable conditions by an expenditure of one-quarter of an hour. The lucifer match supplies a light in 15 seconds on each occasion, or in two minutes for the whole day. Putting these differences into a year, the venerable ancient who still sticks to his tinder-box would require to spend 90 hours yearly in the production of light, while the user of lucifer matches spends 12 hours; so that the latter has an economy of 78 hours yearly, or about 10 working days. Measured by cost of production at 1/6 daily, the economy of time represented in money to our population is £26,000,000 annually.

This is a curious instance of the manner in which science leads to economy of time and wealth even in a small manufacture. In larger industries the economy of time and labor produced by the application of scientific discoveries is beyond all measurement. Thus the discovery of latent heat by Black led to the inventions of Watt, while that of the mechanical equivalent of heat by Joule has been the basis of the progressive improvements in the steam engine which enable power to be obtained by a consumption of fuel less than one-fourth the amount used 20 years ago. It may be that the engines of Watt and Stephenson will yield in their turn to more economical motors; still they have already expanded the wealth, resources and even the territories of England more than all the battles fought by her soldiers or all the treaties negotiated by her diplomatists. The coal which has hitherto been the chief source of power probably represents the product of 5,000,000 or 6,000,000 years during which the sun shone upon the plants of the carboniferous period, and stored up its energy in this convenient form. But we are using this conserved force wastefully and prodigally, for, although horse-power in steam engines has so largely increased since 1864, two men only now produce what three men did at that date.

It is only 300 years since we became a manufacturing country. According to Professor Dewar, in less than 200 years more the coal of this country will be wholly exhausted, and in half that time will be difficult to procure. Our not very distant descendants will have to face the problem, What will be the condition of England without coal? The answer to that question depends upon the intellectual development of the nation at that time. The value of the intellectual factor of production is continually increasing, while the values of raw material and fuel are lessening factors. It may be that when the dreaded time of exhausted fuel has arrived its importation from other coal-fields, such as those of New South Wales, will be so easy and cheap that the increased technical education of our operatives may largely overbalance the disadvantages of increased cost in fuel. But this supposes that future Governments in England will have more enlightened views as to the value of science than past Governments have possessed. Industrial applications are but the overflowings of science welling over from the fullness of its measure. Few would ask now, as was constantly done a few years ago, "What is the use of an abstract discovery in science?" Faraday once answered this question by another, "What is the use of a baby?" Yet around that baby center all the hopes and sentiments of its parents, and even the interests of the State, which interferes in its up-bringing, so as to insure it being a capable citizen. The processes of mind which produce a discovery or an invention are rarely associated in the same person, for, while the discoverer seeks to explain causes and the relations of phenomena, the inventor aims at producing new effects, or at least of obtaining them in a novel and efficient way. In this the inventor may sometimes succeed without much knowledge of science, though his labors are infinitely more productive when he understands the causes of the effects which he desires to produce.

Science has in the last 100 years altered altogether the old conditions of industrial competition. She has taught the rigid metals to convey and record our thoughts even to the most distant lands, and, within less limits, to reproduce our speech. This marvelous application of electricity has diminished the cares and responsibilities of Governments, while it has at the same time altered the whole practice of commerce. To England steam and electricity have been of incalculable advantage. The ocean, which once made the country insular and isolated, is now the very life-blood of England and of the greater England beyond the seas. As in the human body the blood bathes all its parts, and through its traveling corpuscles carries force to all its members, so in the body politic of England and its pelagic extensions steam has become the circulatory and electricity the nervous system. The colonies, being young countries, value their raw materials as their chief sources of wealth. When they become older they will discover it is not in these, but in the culture of scientific intellect, that their future prosperity depends. Older nations recognize this as the law of progress more than we do; or, as Jules Simon tersely puts it, "That nation which most educates her people will become the greatest nation, if not to-day, certainly to-morrow." Higher education is the condition of higher prosperity, and the nation which neglects to develop the intellectual factor of production must degenerate, for it cannot stand still. If we felt compelled to adopt the test of science given by Comte, that its value must be measured by fecundity, it might be prudent to claim industrial inventions as the immediate fruit of the tree of science, though the only fruit which the prolific tree has shed. But the test is untrue in the sense indicated, or rather the fruit, according to the simile of Bacon, is like the golden apples which Aphrodite gave to the suitor of Atalanta, who lagged in his course by stooping to pick them up, and so lost the race. The true cultivators of the tree of science must seek their own reward by seeing it flourish, and let others devote their attention to the possible practical advantages which may result from their labors.

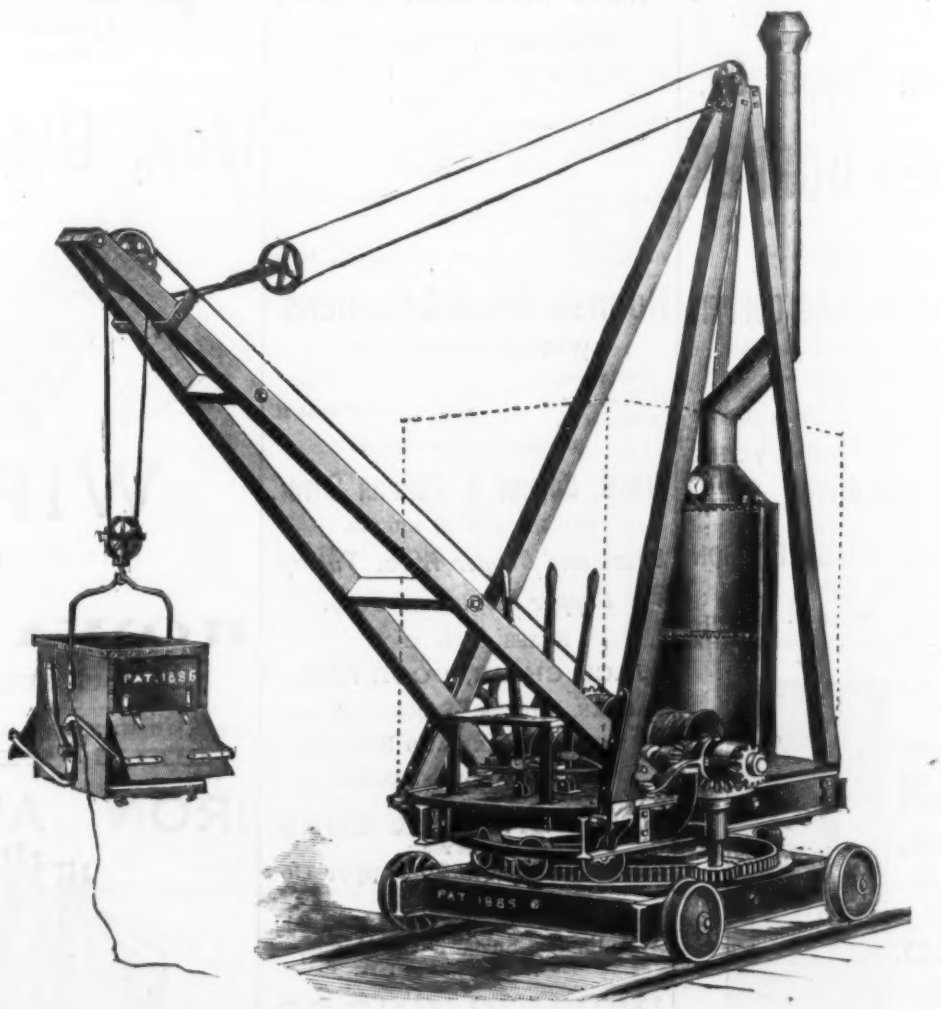

Fig 1.—Standard Derrick.

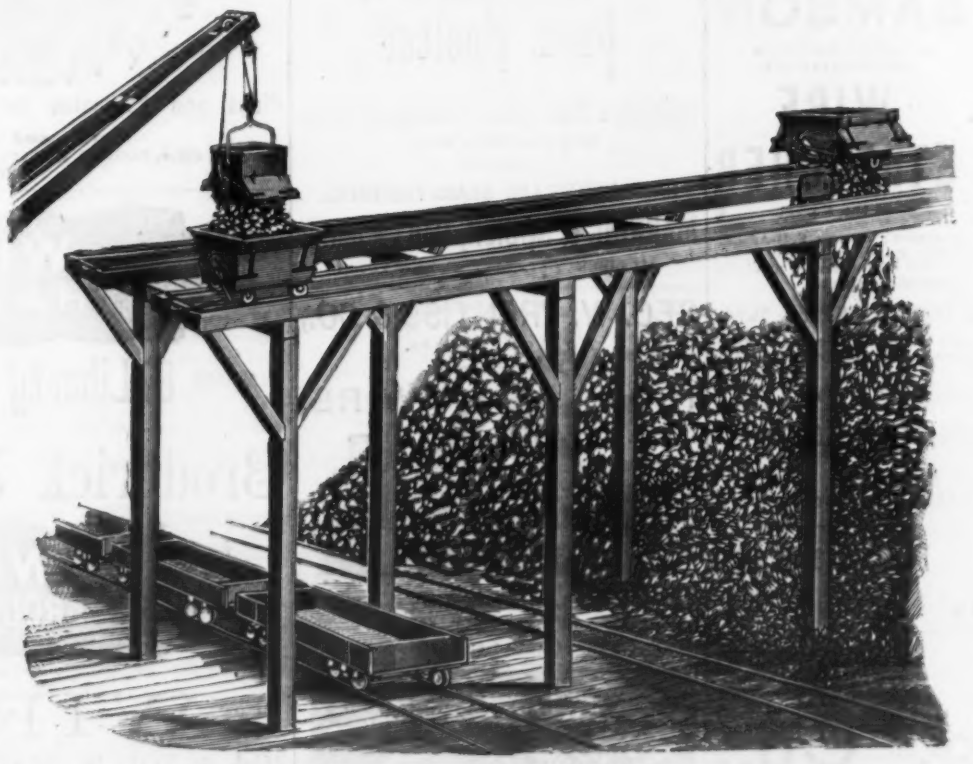

Fig. 2.—Perspective View of Conveying Plant.

COAL-HANDLING MACHINERY, BUILT BY THE STANDARD DERRICK AND CONVEYOR CO., CLEVELAND, OHIO.

Coal-Handling Machinery.

In view of the comparatively meager character of published particulars of coal-handling machinery, contributions to the literature of this subject cannot fail to prove welcome and to embrace points of special and general interest. Mr. A. N. Simmerly's hoisting and conveying plant, of which we present engravings in this issue, will accordingly, no doubt, be examined with attention, embodying, moreover, several novel features well worth considering. Figs. 1 and 2 of our illustrations show the derrick, buckets and cars in perspective, a special feature of the derrick being that the engine and hoisting machinery are firmly bolted to a solid iron bed plate, insuring against any racking or getting out of line. Being independent of the carriage, moreover, any difficulty which might result from settling of the dock is readily overcome. The hoisting and rotating gear has 216 square inches of friction surface, which, with the combined clutch and brake band, insures safety in operating. The construction of the buckets will be understood from Figs. 3 and 4, the former being an end elevation and the latter a side elevation, with part broken away so as to show the internal arrangement. The bucket is made of sheet metal and has a bottom inclining in opposite directions from a central line. Hinged doors are arranged upon opposite sides, the hinges being uppermost, and from each door curved links extend inward past each other, and are secured to cross-bars upon a rock shaft in such a manner that the points of connection, when the doors are closed, are in a position past the center of motion of the rock-shaft. This position firmly locks the doors in place and avoids the necessity of any securing devices whatever, while the greater the pressure upon the doors the more firmly will they be locked, until a lever is operated to force the pivots upon the other side of the center, when the pressure upon the doors will open them.

The arrangement is very clearly shown in Fig. 3. A considerable percentage of loss is sustained in handling coal or ore, due to the breaking up of the material. This loss, where turning buckets are used, has been estimated at 18 per cent., and is due to the fact that the necessary room for turning the bucket gives more or less fall to the contents—say 6 or 7 feet. In Mr. Simmerly's construction the bucket may be lowered as far as desired, and by the proper manipulation of the lever the contents may be easily deposited without any appreciable damage. After the contents have been dropped the

(*Concluded on page 7.*)

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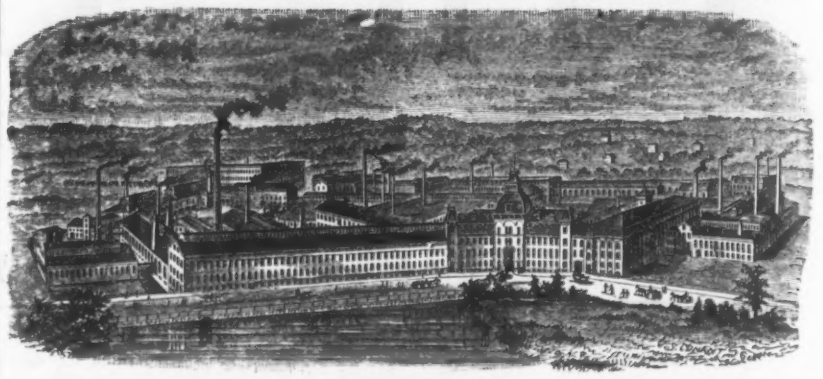

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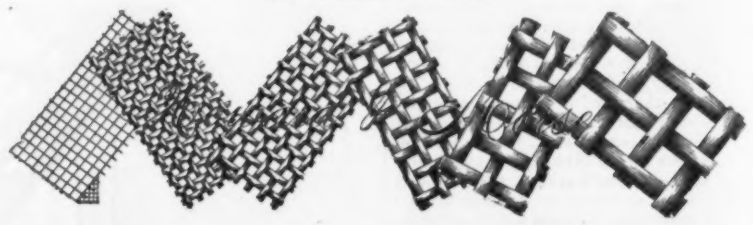

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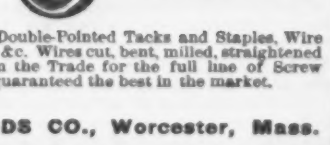

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The First Trials of the Bessemer Process in Scotland.

A very early, but a very crude, trial of the Bessemer process was made in Scotland in the year 1857 by Mr. Thomas Jackson, at the Coats Iron Works, who describes it as follows:

"My attention was first drawn to the subject by drawings in the *Illustrated News*. From these drawings and accompanying letter-press we had the necessary apparatus fitted, and on a very simple plan. An old locomotive cylinder attached to the engine of the turning lathe served as a blast cylinder. The foundry cupola and Bessemer furnace were lengths of old boiler tube lined with brick and erected close together. The charges varied from 5 cwt. to 10 cwt.; the pig iron used, Eglinton No. 1, in those days a very superior brand. From a charge of this iron drawn off in the state of refined metal, which was then puddled and rolled, and afterward re-rolled into merchant bars, the result was B-best iron. We had no difficulty in rolling the blooms obtained into the usual 3-inch by ⅝-inch rough bars, and these were piled and re-rolled into merchant bars, and from a piece of 3 inch by ½-inch a sheet was rolled out at Govan Bar Iron Works as thin as paper and pliable. So far as I am aware, no other iron was rolled successfully from the experiments conducted at that period here in Scotland. A piece of the above bar iron was analyzed by Dr. Penny, Professor of Chemistry in the Andersonian University, Glasgow, who duly reported that the substance was chemically pure iron, but commercially valueless, being what the workmen usually style 'burnt iron.' It seemed to be impossible to hit the point when the iron could be run from the converter to produce good malleable iron. I am writing from memory, and, although several notices were taken of these experiments, I can only find one contained in the *Journal of the Society of Arts*."

A paper describing this experiment was read before the Philosophical Society of Glasgow, by Mr. William Cockey, on February 11, 1857: "The experiments were conducted as nearly as possible according to the method described to the public by the patentee. The form of the Bessemer furnace was cylindrical, being 18 inches in diameter and with six tuyeres, each ⅜ inch in diameter, entering almost on a level with the bottom of the furnace. The pig iron used was one of the best brands of the firm (Eglinton), and No. 1, or softest, quality; the quantity operated on about 8 cwt. The pig iron, when melted in the ordinary foundry cupola, was run direct into the Bessemer furnace, which had been previously well heated. The blast was then applied, and, beginning at a pressure of 8 pounds, was raised during the process to 11 pounds, and afterward allowed to descend to 5 pounds. The appearance of the action going on was similar to that usually ascribed to it; and when, from the subsidence of the ebullition and the change of flame to a purple color, the process was deemed concluded, the metal was run into molds (18 x 4 x 4 inches). These blooms, after cooling, were reheated and rolled into bars, and these, cut up into equal lengths, were piled nine high, and again rolled into bars, the same mode having thus been pursued as that adopted to manufacture marketable iron. The iron was found quite unfit for commercial purposes from its brittleness. The percentage of loss was invariably much greater than by the old process, being as high as 17 per cent. above the usual waste."

It will be evident that in this trial the object aimed at was a mistaken one (they were really seeking to make a malleable iron), and also that the trial was scarcely on such a scale or conducted with such full information as was likely to lead to success. About the same time William Dixon, Limited, having entered into arrangements with Mr. Bessemer, made a more complete and systematic trial of the new process under the personal supervision of the inventor. A small but complete plant was erected, and operations conducted for some time, Scotch iron being used in the converter. Owing to the amount of phosphorus present, the resulting steel was unsatisfactory, and, as this could not be reduced when dealing with their own pig iron, the licensees abandoned the process, Mr. Bessemer returning the sum paid by them for their license.

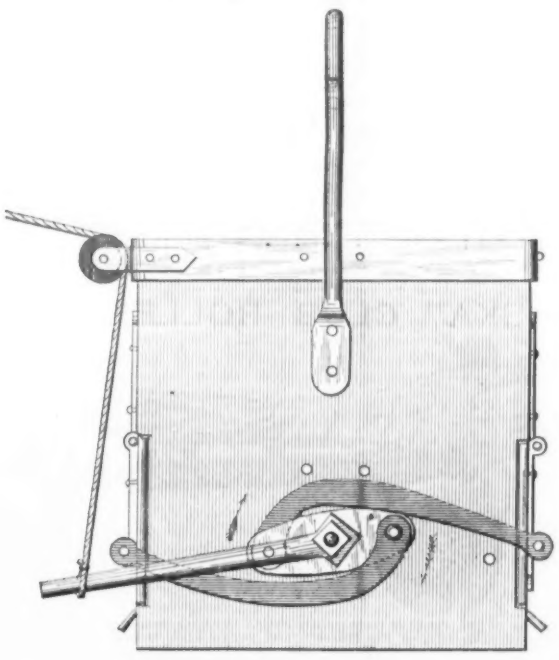
An electric process of melting ore for production of alloys, bronzes and other metallic compounds has recently been brought out. For the purpose of illustrating the process, we will assume that aluminium bronze is to be made. The pulverized ore of aluminium is mixed with the broken carbon along with a pulverized ore of copper, and the charge of the mixed ores is packed between two carbon plates. If desired metallic copper may be used in place of the copper ore, in which case metallic copper is distributed in such a manner that it cannot short-circuit the current. When the current is passed through the core, the heat generated thereby melts the metallic copper or reduces the copper or other ore to metal, and the metallic copper takes up the aluminium as it is reduced from the aluminous ore. The product obtained at the close of the operation is an aluminium-copper alloy or aluminium bronze. This process has been patented by E. H. and A. H. Cowles, of Cleveland, Ohio.

A battery of boilers at the Solar Iron Works, Pittsburgh, exploded on Friday, injuring nearly a score of persons and killing two outright. Mr. Powers, the chief engineer, says the boilers and mud drums were inspected by the Hartford Insurance Co. two months ago, and were then pronounced safe, but it is pretty clear that the explosion was caused by corrosion. Some pieces of the drum that were picked up were not more than ¼ inch in thickness. A remarkable feature was the jamming of the mud drum's head against one of the engines situated a few yards distant. The burst iron, blown directly against the cylinder head of the engine, smashed it to pieces and blew the whole head inward. From this the steam rushed out with a loud, hissing sound. Machines and benches were thrown together in inextricable masses.

(Concluded from page 1.)

doors close by gravity, and the weight of the lever throws the pivots of the curved links past the center line, ready for another charge. This locking arrangement is both simple and convenient and of unquestionable merit. In some other forms of buckets which have been brought out the connecting links do not go past the center of motion of the rock-shaft, as in this case, and there is accordingly danger of the fastening jarring loose. This danger has proved so apparent in some cases that an independent catch was employed to lock the lever. Mr. Simmerly's arrangement is applied also to the cars, shown in Fig. 2, though in this case, obviously, the advantage of reduced fall for the charge cannot always be secured.

The machinery is built by the Standard Derrick and Conveyor Company, Messrs. A. N. Simmerly & Co., proprietors, of Cleveland, Ohio. Fig. 1 represents what is known as their "Standard" derrick. It is equipped with either single or double engine, as may be desired, with 9 x 12 cylinder, steam pump, boiler, &c., complete, and its capacity ranges from 600 to 1000 tons of coal per day of 10 hours, according to the skill of the attendant. It will, of course be understood that the machinery described is adapted not only to the handling of coal, but also of ore and other material. The cars, as shown in Fig. 2, are built to carry about 1 ton of coal, and the trip can be set to dump the car at any point desired from the place of loading.



Coal-Handling Machinery.—Fig. 3.—End View of Bucket, Showing the Operating Lever.

The Steel for the Forth Bridge.

During the recent visit of the Iron and Steel Institute, Mr. B. Baker, one of the engineers of the Forth Bridge, read a paper on that great structure, in which he refers as follows to the steel used: "For certain parts of the Forth Bridge we use steel of a higher tensile strength than is at present considered admissible either for ships or boilers. This has not been done without full and mature consideration of the whole question. Our experiments showed that steel having a tensile strength of from 34 to 37 tons per square inch offered a decided advantage over very mild steel when compressive stresses and the flexure of long columns were concerned. Indeed, an inferior quality of steel, such as would be used for rails, will stand compression far better than the best boiler steel or Low Moor iron. Thus, I found a column 20 diameters in length of common Bessemer steel carry 27 tons per square inch where one of mild boiler steel has stood but 17 tons. It would be inexpedient, however, to use inferior steel even for the compressive members of a bridge, and therefore a high quality and high tensile resistance were indicated. Although this steel takes a temper and becomes brittle if cooled in certain ways, it will stand the ordinary Admiralty temper tests, bending to a radius of double the thickness after being made red-hot and cooled in the usual way. In a boiler the steel plates are subject to great changes of temperature and consequent stresses from expansion and contraction. In a ship almost every plate in the hull is subject to alternate tensile and compressive stresses when among waves; and further, a vessel is liable to severe alternating stresses and shocks on taking ground, dry docking and under other circumstances. In the compression members of the Forth Bridge the steel is subject only to a steady pressure of varying intensity, and a quality of steel was adopted which combined perfect facility in working with a high resistance to compression. Although an increased tensile strength is accompanied by a decidedly increased resistance to flexure in columns and struts, the latter is not proportional to the former.

"If the thing were practicable, what I should choose as the material for the compression members of a bridge would be 34 to 37 ton steel which had been previously squeezed endwise in the direction of the stress to a pressure of about 45 tons per square inch, the steel plates being held in suitable frames to prevent distortion. My experiments have proved that 37-ton steel so treated will carry as a column as much load as 70-ton steel in the state in which it leaves the rolls—that is to say, not previously pressed endwise. It would be a matter of much practical moment to ascertain if some convenient treatment could be devised which would endow steel with this greatly increased power of resistance to compression without injuring its resistance to tension, or its ductility, which remained unaffected by previous compression in my experiments. At least one-half of the 42,000 tons of steel in the Forth Bridge is in compression, and the same proportion holds good in most bridges, so the importance of gaining an increased resistance of 60 per cent. without any sacrifice in the facility of working, and safely belonging to a highly ductile material, can hardly be exaggerated. Our experience has led us to the conclusion that sheared edges are a more fruitful source of fracture than partial tempering or other contingencies. All of our bent plates are made red-hot, and the effect of the shearing is thus eliminated even before planing. Those plates which are not heated have the edges carefully planed, so as to leave no trace of the shearing, and we find that, whether we are dealing with 30-ton or 37-ton steel, the plates so treated stand all the desired tests. Experiments which I have made, and am still making, on the resisting power of different classes of iron and steel to repeated bendings, such as the shaft of a marine engine undergoes if the bearings get out of line, indicate that the superiority of low-tension steel is considerably greater than the increased ductility would indicate."

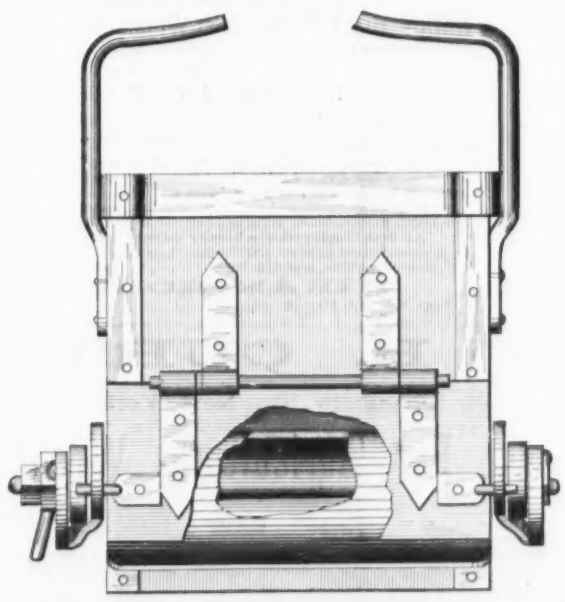


Fig. 4.—Side Elevation of Bucket.

Shear blades which will cut hot blooms and bars without becoming injuriously softened have been patented by S. M. Guss, of Reading, Pa. A pipe connected with a raised water reservoir conducts the water into a tube within a chamber drilled in the shear blade near the cutting edge. The water thence passes into the annular space around the tube and is discharged. The speed of the current may be regulated by a cock, and the escaping water may be discharged upon and in a line with the cutting edge of the blade. A flexible hose or its equivalent may be used for the supply of the movable blade. By this invention the blades are said to retain their temper, though constantly employed in cutting red-hot blooms.

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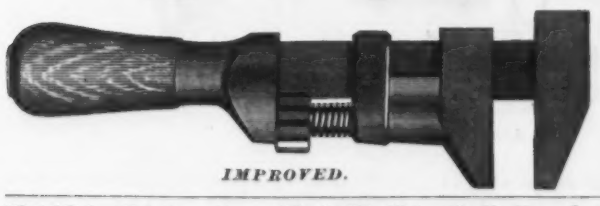

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Handsaw Taper, slim,
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Hook-Tooth,
Knife,
Knife Blunt,
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Lightning,
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Mill Blunt,
Mill Pointing,
Pillar,
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Reaper,
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The Effect of Intermittent Strains Upon Iron Structures.*

BY B. BAKER.

"Mechanical science," said Professor Rankine, "enables its possessor to plan a structure or machine for a given purpose without the necessity of copying some existent example; to compute the theoretical limit of the strength and stability of a structure or the efficiency of a machine of a particular kind; to ascertain how far an actual structure or machine fails to attain that limit, and to discover the cause and remedy of such shortcoming; to determine to what extent, in laying down principles for practical use, it is advantageous for the sake of simplicity to deviate from the exactness required by pure science, and to judge how far an existing practical rule is founded on reason, how far on custom and how far on error." There is thus an ample text for many discourses; but, as I am not writing a treatise on engineering, but merely delivering a brief address, I will confine my attention at present to a particular case of the branch of mechanical science referred to in the last clause of Professor Rankine's definition, and will ask you to consider how far the existing practical rules respecting the strength of metallic bridges are "founded on reason, how far on custom and how far on error."

The first question obviously is, What are the rules adopted by engineers and Government departments at the present time? and it is one not easily answered. I have for some time past been receiving communications from leading Continental and American engineers, asking me what is my practice as regards the admissible intensity of stress on iron and steel bridges, and in replying I have invited similar communications from themselves. As a result I am able to say that at the present time absolute chaos prevails. The old foundations are shaken, and engineers have not come to any agreement respecting the rebuilding of the structure. The variance in the strength of existing bridges is such as to be apparent to the educated eye without any calculation. If the wheels of a miniature brougham were fitted to a heavy cart the incident would excite the derision even of our street boys, and yet equal want of reason and method is to be found in hundreds of bridges in all countries. It is an open secret that nearly all the large railway companies are strengthening their bridges, and necessarily so, for I could cite cases where the working stress on the iron has exceeded by 250 per cent. that considered admissible by leading American and German bridge-builders in similar structures.

In the case of old bridges the variance in strength is often partly due to errors in hypothesis and miscalculation of stresses. In the present day engineers of all countries are in accord as to the principles of estimating the magnitude of the stresses in the different members of a structure, but not so in proportioning the members to resist those stresses. The practical result is that a bridge which would be passed by the English Board of Trade would require to be strengthened 5 per cent. in some parts and 60 per cent. in others before it would be accepted by the German Government or by any of the leading railway companies of America. This undesirable state of affairs arises from the fact that in our own and some other countries many engineers still persistently ignore the fact that a bar of iron may be broken in two ways—namely, by the single application of a heavy stress or by the repeated application of a comparatively light stress. An athlete's muscles have often been likened to a bar of iron, but, if "fatigue" be in question, the simile is very wide of the truth. Intermittent action—the alternative pull and thrust of the rower, or of the laborer turning a winch—is what the muscle likes and the bar of iron abhors. Troopers dismount to rest their horses, but to relieve a bar of iron temporarily of load only serves to fatigue it. Half a century ago Braithwaite correctly attributed the failure of some girders, carrying a large brewery vat, to the vessel being sometimes full and sometimes empty, the repeated deflection, although imperceptibly slow and wholly free from vibration, deteriorating the metal until, in the course of years, the girders broke. These girders were of cast iron, but it was equally well known that wrought iron was similarly affected, for in 1842 Nasmyth called the attention of this section to the fact that the "alternate strain" in axles rendered them weak and brittle, and suggested annealing as a remedy, he having found that an axle which would snap with one blow when worn would bear 18 blows when new or after being annealed. So important a matter as the action of intermittent stresses could not escape the attention of the Royal Commissioners appointed in 1849 to consider the application of iron to railway structures, and some significant and sufficiently conclusive experiments were made by Captain Douglas Galton and others. Cast-iron bars 3 inches square and 13 feet 6 inches span between the supports were deflected, both by the slow action of a cam and the percussive action of a swinging pendulum weight. When the deflection was that due to one-third of the breaking weight, about 50,000 successive bendings by the cam broke one of the bars, and about 1000 blows from the pendulum another. When the deflection was increased from one-third to one-half, about 500 applications of the cam and 100 blows sufficed to rupture two of the specimens. Slow-moving weights on bars and on a small wrought-iron box girder gave analogous results, and the deduction drawn by the experimenters at the time was that "iron bars scarcely bear the reiterated application of one-third the breaking weight without injury; hence the prudence of always making beams capable of bearing six times the greatest weight that could be laid upon them."

Although these experiments were entirely confirmatory of all previous experience, they would appear to have little influenced the practice of engineers, since Fairbairn, more than ten years later, in a communication to this section, said that opinions were still much divided upon the question whether the continuous change of load which many wrought-iron structures undergo has any permanent effect upon their ultimate powers of resistance. To assist in settling the question he communicated to the association the results of some experiments carried out by himself and Professor Unwin on a little riveted girder 20 feet span and 16 inches deep. Once more the same important, but disregarded, facts were enforced on the attention of the engineers. About 5000 applications of a load equal to four-tenths of the calculated breaking load fractured the beam with the small ultimate deflection of 3/16 inch, and subsequently, when repaired, the beam broke with one-third of the load and a deflection of but 1/4 inch, which sufficiently indicated how small a margin the factor of safety of four, then currently adopted, allowed for defective manufacture, inferior material and errors in calculation. Still, nothing was done, and the general practice of engineers and the Board of Trade regulations continued unaltered.

Soon after the introduction of wrought-iron bridges on railways the testimony of practical working was added to that of experiments. In 1848 several girder bridges of unduly light proportions were erected in America, and one of 66 feet span broke down under the action of the rolling load in the same manner as Fairbairn's little experimental girder. Again, in early American timber bridges the vertical tie-rods were often subject to stresses oscillating between 1 ton and 10 tons per square inch and upward. Many of these broke, as did also the suspension bolts in platforms subjected to similar stresses. In my own experience dozens of broken flange-plates and angle-bars, and hundreds of sheared rivets, have been the silent witnesses of the destructive action of a live load. Like evidence was afforded by early-constructed iron ships deficient in girder strength. Under the alternating stresses due to the action of the waves, weaknesses not at first apparent would in the course of time be developed, and additional strength, in the way of stringers and otherwise, become imperative.

If none of the preceding evidence had been forthcoming the results of the historical series of experiments carried out by Wöhler for the Prussian Ministry of Commerce would alone be conclusive. For the first time a truly scientific method of investigation was followed, and an attempt was made to determine the laws governing the already proved destructive action of intermittent stresses. In previous experiments the bar or girder was alternately fully loaded and wholly relieved of load. Wöhler was not satisfied with this, but tested also the result of a partial relief of load. The striking fact was soon evidenced on testing specimens under varying tensions that the amount of the variation was as necessary to be considered as that of the maximum stress. Thus, an iron bar having a tensile strength of 24 tons per square inch broke with about 100,000 applications of a stress varying from *nil* to 21 tons, but resisted 4,000,000 applications of the 21 tons when the minimum stress was varied from *nil* to 11½ tons. The alternations of stress in the case of some test pieces numbered no less than 132,000,000, and too much credit cannot be bestowed by engineers upon Wöhler for the ingenuity and patience which characterized his researches. As a result, it is proved beyond all further question that any bar or beam of cast iron, wrought iron or steel may be fractured by the continued repetition of comparatively small stresses, and that, as the differences of stress increase, the maximum stress capable of being sustained diminishes.

Various formulæ based upon the preceding experiments have been proposed for the determination of the proper sectional area of the members of metallic structures. These formulæ differ in some essential respects, and doubtless many experiments are still required before any universally accepted rules can be laid down. Probably at the present time the engineers who have given the most attention to the subject are fairly in accord in holding that the admissible stress per square inch in a wrought iron girder subject to a steady dead load would be one and a half times as great as that in a girder subject to a wholly live load, and three times that allowable in members subject to alternate tensile and compressive stresses of equal intensity, such as the piston rod of a steam engine or the central web-bracing of a lattice girder. If the alternations of stress to be guarded against are not assumably infinite in number, but only occasional—as in wind bracing for hurricane pressures, or in a vessel among exceptionally high waves—then the aforesaid ratio of 3, 2 and 1 would not apply, but would more nearly approach the ratios 6, 5 and 4.

Hundreds of existing railway bridges, which carry 20 trains a day with perfect safety, would break down quickly under 20 trains per hour. This fact was forced on my attention nearly 20 years ago by the fracture of a number of iron girders of ordinary strength under a five-minute train service. Similarly, when in New York last year, I noticed, in the case of some hundreds of girders on the elevated railway, that the alternate thrust and pull on the central diagonals from trains passing every two or three minutes had developed weakness which necessitated the bars being replaced by stronger ones after a very short service. Somewhat the same thing had to be done recently in this country with a bridge over the Trent, but, the train service being small, the life of the bars was measured by years instead of months.

If ships were always among great waves the number going to the bottom would be largely increased, for, according to Mr. John, late of Lloyd's, "many large merchant steamers afloat are so deficient in longitudinal strength that they are liable under certain conditions of sea to be strained in the upper works to a tension of from 8 to 9 tons per square inch, and to a compression of from 6 to 7 tons—stresses which the experiments already referred to proved would cause failure after a definite number of repetitions. Similarly, on taking ground or being dry-docked with a heavy cargo on board, it has been shown that vessels are liable to stresses of over 11 tons per square inch on the reverse frames, but no permanent injury

* From the opening address as president of the Section of Mechanical Science at the Aberdeen meeting of the British Association.

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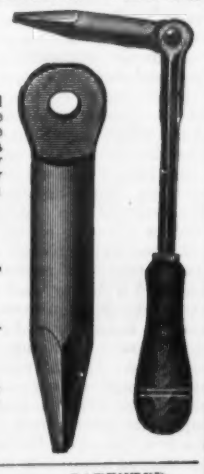

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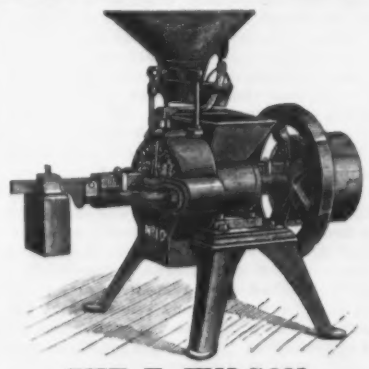

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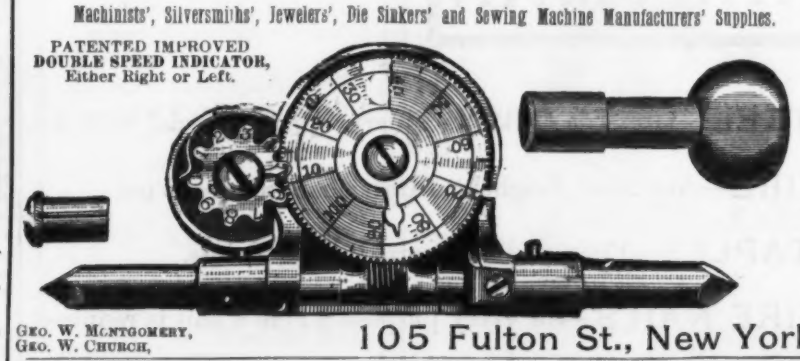

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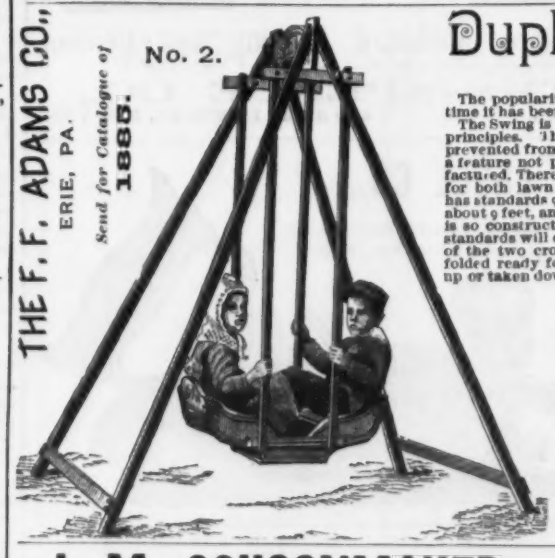

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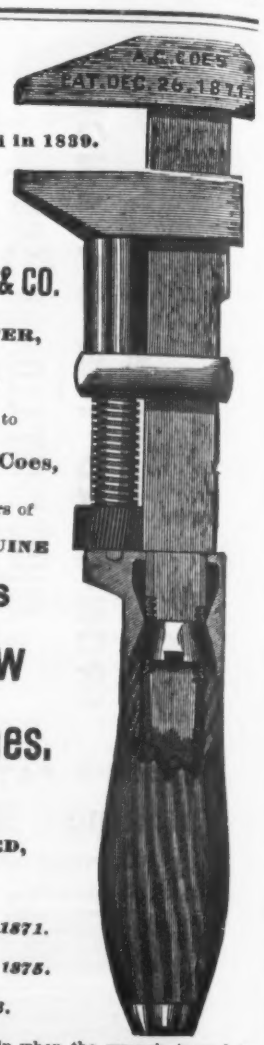

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results from such high stresses, because the number of repetitions is necessarily very limited.

It appears natural enough to every one that a piece even of the toughest wire should be quickly broken if bent backward and forward to a sharp angle, but perhaps only to locomotive and marine engineers does it appear equally natural that the same result would follow in time if the bending were so small as to be quite imperceptible to the eye. A locomotive crank-axle bends but $\frac{1}{64}$ inch, and a straight driving axle the still smaller amount of $\frac{1}{74}$ inch under the heaviest bending stresses to which they are subject, and yet their life is limited. During the year 1883 one iron axle in 50 broke in running, and one in 15 was renewed in consequence of defects. Taking iron and steel axles together, the number then in use on the railways of the United Kingdom was 14,848, and of these 911 required renewal during the year. Similarly during the past three years no less than 228 ocean steamers were disabled by broken shafts, the average safe life of which is said to be about three or four years. In other words, experience has proved that a very moderate stress alternating from tension to compression, if repeated about 100,000,000 times, will cause fracture as surely as a sharp bending to an angle repeated perhaps only 10 times.

I have myself made many experiments with a view to elucidate the laws affecting the strength of iron and steel work subject to frequent alternations of stress. Perhaps the most suggestive series was one in which I subjected flat steel bars about 3 feet long, in pairs, to repeated bendings until one bar broke, and then testing the surviving bar under direct tensile and compressive stresses to ascertain to what extent the metal had deteriorated. It had come under my notice as a practical engineer that if the compression members of a structure were unduly weak the fact became quickly evident, perhaps under the test load; but if, on the other hand, the tension members were weak, no evidence might appear of the fact until frequent repetition of stresses during several years had caused them to fracture without any measurable elongation of the metal. In the case of crank-shafts, also, the fracture is invariably due to a tearing, and not a crushing, action. It appeared to me, therefore, eminently probable that repetition of stresses might be far more prejudicial to tension than to compression members, and, if so, the fact ought to be taken account of in proportioning a structure.

This proved to be the case in my experiments. For example, the companion bars to those which had broken with 18,000 reversals of a stress less than half the original breaking weight behaved, when tested as columns 30 diameters in length, precisely the same as similar bars which had done no work at all, whereas when tested in tension the elongation was reduced from the original 25 per cent. to 2.5 per cent, and the fracture appeared to indicate that the bars had been made of three different kinds of steel imperfectly welded together. With a stress reduced by one-fourth, the number of bendings required to break the bars was increased to 1,200,000. In this instance the calculated maximum working stress on the extreme fibers was 43 per cent. of the direct ultimate tensile resistance of the steel, and about 30 per cent. of the stress the bar was capable of sustaining as a beam under the single application of a load. Of course the bars failed by tension, and the extreme fibers had thus deteriorated as regards tensile stresses to the extent indicated by the above percentages. Tested as a column, however, the injury the bar had received from the 1,200,000 bendings was inappreciable. The ductility was, of course, very largely reduced, but ductility is a quality of comparatively little importance when a material is in compression. There is no ductility in the slender Gothic stone columns of our cathedrals, which, though heavily stressed, have carried their loads for centuries. As I found repeated bendings raised the limit of elasticity, I rather anticipated finding an increased resistance from this cause in long columns. This did not prove to be the case, nor did I find any difference in short columns four diameters in length.

In addition to the preceding experiments with rectangular bars, I have tested the endurance of many revolving shafts of cast iron, wrought iron and steel, with similar results. About 5000 reversals of a stress equal to one-half the static breaking weight sufficed generally to cause the snapping of a shaft of any of the above materials. When the stress was reduced and the number of applications increased, I found the relative endurance of solid beams to be more nearly proportional to the tensile strength of the metal than to the breaking weight of the beam, a distinction of great importance where axles, springs and similar things are concerned. Many of my experiments were singularly suggestive. Thus, it was instructive to see a bar of cast iron loaded with a weight which, according to Fairbairn's experiments, it should have carried for a long series of years, broken in two minutes when set gently rotating. Also to find a bar of the finest mild steel so changed in constitution by some months of rotation as to offer no advantages either in strength or toughness over a new cast-iron bar of the same section.

Although, as already stated, many more experiments are required before universally acceptable rules can be laid down, I have thoroughly convinced myself that, where stresses of varying intensity occur, tension and compression members should be treated on an entirely different basis. If, in the case of a tension member, the sectional area be increased 50 per cent. because the stress, instead of being constant, ranges from *nil* to the maximum, then I think 20 per cent. increase would be a liberal allowance in the case of a compression member. I have also satisfied myself that if a metallic railway bridge is to be built at a minimum first cost, and be free from all future charges for structural maintenance, it is essential to vary the working stress upon the metal within very wide limits, regard being had not merely to the effect of intermittent stresses, but also to the relative limits of elasticity in tension and compression members even under a steady load.

Why an originally strong and ductile metal should become weak and brittle under the frequent repetition of a moderate stress has not yet been explained. Lord Bacon touched upon the subject two or three centuries ago, but you may consider his explanation not wholly satisfactory. He said, "Of bodies, some are fragile, and some are tough and not fragile. Of fragility, the cause is an impotency to be extended, and the cause of this inaptness is the small quantity of spirits." I am sorry to have no better explanation to offer, but, whatever may be the immediate cause of fragility, no doubt exists that it is induced in metals by frequent bendings, such as a railway bridge undergoes. This fact, however, is not recognized in our Board of Trade Regulations, which remain as they were in the dark ages, as do those of the Ministry of Public Works of France and other countries. With us it is simply provided that the stress on an iron bridge must not exceed 5 tons per square inch on the effective section of the metal. In France it is still worse, as the limiting stress of rather under 4 tons per square inch is estimated upon the gross section, regardless of the extent to which the plates may be perforated by rivet holes. In neither case is any regard had in the rules to intermittent stresses or the flexure of compression members. In Austria the regulations make a small provision for these elements; and American specifications make a large one, the limiting stresses, instead of being constant at 5 tons, as with us, ranging from about 2½ tons to 6¾ tons per square inch, according to circumstances. It is hardly necessary that I should say more to justify my statement that, as regards the admissible intensity of stress on metallic bridges, absolute chaos prevails.

Engineers must remember that if satisfactory rules are to be framed they, and not Governmental departments, must take the initiative. In former days the British Association did much to direct the attention of engineers to this important matter, but, so far as I know, the subject has been dropped for the past 20 years, and I have ventured, therefore, to bring it before you again in some detail. Mr. Baker then referred to the fact that the labors of the present generation of engineers are lightened beyond all estimate by labor-saving appliances. To prove how much the world is indebted to students of this branch of mechanical science, and how rapid is the development of a really good mechanical notion, it is only necessary to refer to the numerous hydraulic appliances of the kind first introduced 40 years ago by a distinguished past president, Sir W. G. Armstrong. It would not only be impossible to build a Forth Bridge, but it would be equally impossible to fight a modern ironclad, without the aid of hydraulic appliances.

Light versus Heavy Axes.

A correspondent of the Albany *Cultivator* describes his experience with axes as follows:

I well remember my first axe and my early experience with it. It weighed 4¼ pounds, being the heaviest one I could find at the time. I was fresh from school—fresh from a class in natural philosophy, one of my favorite studies. I knew all about *inertia*, and had learned something of the force of gravity and the laws of falling bodies; had rightly guessed that chopping wood might be hard work, and determined that my knowledge of physics should help me out. I would have a heavy axe, a long handle—would move slowly, and take strokes that would count when they fell. My axe handle was 34 inches in length, the longest one in the store. I had hired a tough little French Canadian, weighing about 120 pounds, to help me in this work. When he came he brought an axe—a mere toy I called it. I think it weighed 2½ pounds, with a handle only 26 inches long. I told him I had a fair-sized job for him, and thought it would pay him to buy a full-grown axe. He smiled and said he guessed his would do. I tried to explain to him the beauties of a heavy axe and the wonderful advantage of a long handle. But it was all in vain; I was only wasting time; he could not understand it.

"Poor fellow," I thought; "he knows nothing of the beautiful science of physics. It is too bad that he should thus waste his strength through ignorance, and be unwilling to listen to the voice of wisdom."

We went to the wood lot and began work. I had decided that we would work separately during the first day or two, in order that I might show him what I could do. As I began to swing my axe I felt proud of its ponderous blows that rang through the woods, and rather pitied the poor fellow who was drumming away with his little axe, taking about two blows to my one. Presently I had to stop to rest, and then again, and still again; but Joe, my man, kept pecking away quietly, steadily and easily. Every few minutes I would stop to take breath, but Joe seemed perfectly able to do all necessary breathing without stopping his work for the purpose. When night came we piled up our wood and measured it. Joe's pile measured one and a half cords, mine only three-quarters of a cord.

During the early part of the day I had planned giving Joe another lesson in the evening, to see if I could not make him understand the elementary principles of wood-cutting and the philosophical requirements of an axe. But when night came I decided that perhaps it would be as well to let him go on in ignorance, and thereafter remained silent upon the subject. The next day I felt lame and stayed at home. Joe put in his cord and a half, as usual. When I went to the woods again Joe and I worked together. Not many days passed before I found an excuse for buying a lighter axe and a shorter handle. And every axe and handle that I have bought since has been lighter and shorter than its predecessor. Whenever I use an axe now I select one very much like Joe's, both in weight and length of handle. I can use this without getting out of breath, and can hit twice in the same place. The result is that I can do more and better work and save a vast amount of strength. I write this as a word of caution to the inexperienced wood-chopper when about to purchase an axe.

The Old Charcoal Furnaces.

Fifty years ago a typical blast furnace could have been described as a stone stack 30 feet square at the base, 20 feet square at the top and 30 feet or less in hight, pierced by one working or forepart arch in the front and one or two tuyere arches on the sides; but one tuyere, however, was ordinarily used. The forepart arch was fitted with a tympstone and a forehearth extended out to a damstone. Blast was delivered cold through clay tuyeres, and between the blast nozzle and tuyere proper there was an annular space through which fully as much air was at times drawn by injection as was delivered through the nozzle under the low pressure of ½ pound to 1 pound per square inch. A high breast or overshot water-wheel operating wooden blowing "tubs" furnished the blast, which was carried through wooden or tin pipes to the tuyeres, and the wheezing of these tubs could be heard at considerable distances from the blast furnace. The casting-house, tophouse, stockhouse and store were often frame buildings, but the extensive stables, the smith shop, the "mansion" and the office were generally of more substantial construction. The tuyere and forepart arches were covered with heavy iron "sows," cast at some neighboring plant, and similar castings in segments of a circle formed the "ring plate" placed in the offset of the masonry, on which the "inwalls," built of shale or slate, were raised. The bottom, the crucible (or hearth) and the boshes were built of sandstone, nicely jointed, the masonry being carried out against the buttresses or corners of the stack, which were in many instances braced by heavy timbers and iron rods to preserve the masonry from injury by expansion.

The thickness of the hearth walls was seldom less than 3 feet, and the crucible inclosed by these walls was ordinarily from 5 to 7 feet in hight and square in section, the bottom being from 24 to 27 inches square. From this point the boshes were battered out so as to slope about 40° from the vertical, or 10 inches horizontal to 12 inches vertical, and the section worked from a square into a circle, until the greatest diameter at top of bosh (generally 8 to 9 feet) was reached; from there the inwalls were drawn in until the top or throat of the furnace measured from 2½ to 3 feet in diameter, and over this an iron plate, with a hole 20 to 24 inches in diameter, was placed. The location selected for the blast furnace was generally on the bank of a stream which furnished the water-power, and close to ground, sufficiently elevated to permit of constructing a "bridge-house" from the top of the furnace stack to the general level, on which were placed the charcoal-houses, ore supply, &c.

When ready to start, the furnace was filled with charcoal, lighted on top, and when the fire reached the tuyeres blast was applied, more charcoal was charged, and the burden of ore and limestone, finely broken, was slowly increased; this generally resulted in a production of from 20 to 30 tons of cold-blast iron per week after the furnace was fairly in operation. The fuel used was exclusively charcoal, which was charged into the tunnel-head by baskets, and the ore and flux were fed by boxes; the number of boxes of ore and the number of baskets of charcoal formed the relation of the "charge." The weekly output above mentioned was about the average; at the commencement of a "blast" the product was small, but as the campaign progressed it became augmented, owing to the enlargement of the crucible and steepening of the bosh due to the stones being cut back by the intense heat at the zone of fusion. The walls were too thick to admit of conducting the heat away with sufficient rapidity to maintain the original slope given the furnace.

The small opening in the tunnel-head plate insured thorough distribution of the stock in the limited area of the throat of the furnace, thus aiding to secure regularity of operation. From this opening flame was constantly emitted, varying with each stroke of the blowing machinery. At many iron works pots, kettles, and stove castings were made directly from the furnace by ladling the molten iron out of the large forehearth. The product of the furnace was carried in wagons, often to distant localities, the castings being disposed of in cities and towns, or the pig iron worked into "blooms" or "anchovies" at forges. Often a forge was operated in connection with the furnace.

Each furnace maintained a general store, and most of the pay due the wood-choppers, charcoal-burners, ore-miners, teamsters, furnacemen, &c., was expected to be expended at the store. In fact, it has been claimed that some old managers would reduce the balance due a workman at the end of the year if it was believed that he had "saved too much," or, rather, "traded too little." The question of "company stores" has caused considerable discussion at various times, and in some States legislation now nominally forbids them, or places restrictions upon their management.

As most of the blast furnaces were located in a section of the country where winter interfered with out-of-door work, and as their construction was such that the interior was rapidly destroyed, the practice of making a "blast" every year was followed. Wood would be cut during the winter, and, as soon as the weather permitted of doing so, hearths would be leveled among the cut timber, wood would be hauled to these hearths, and there piled into "meilers," covered with leaves and earth and fired. After about two weeks of carbonization the charcoal would be "drawn," and hauled by wagons to the furnace. When a sufficient quantity of charcoal had accumulated to insure a regular supply, the furnace was blown in, and, except for some accident, low stage of water or other disturbing cause, it would be continued in blast until all the charcoal which had been made in the coaling season was consumed. This generally permitted the furnace to be active eight or nine months in the year.

The "blowing in" was an important event at the furnace, generally requiring several days, and was ordinarily an annual occurrence each spring, the date being fixed by the possibilities of securing a supply of fresh charcoal. When the furnace was "blown out" it would be cleaned out, the old hearth, which had become considerably enlarged, would be removed and a new one put in place, when the same yearly routine would be continued. The ores used were chiefly brown hematites, which are easily smelted in the furnace, and they are mixed with a small percentage of lime and clay to flux impurities and make cinder. The cinder was allowed to flow continually over the damstone and form into cakes upon stones laid in the floor of the casting-house. When pig iron was cast the iron passed through one long runner to feed pig-iron molds at right angles to it, one side of the casting-house being devoted to pig iron and the other side to cinder. While many features of plant or practice as described have been abandoned, there are still instances where all of the above-mentioned appliances or methods are in use, and individual plants can be cited for which this description would be practically a record of present arrangement and management. Such instances are, however, becoming less numerous each year.

The stone masonry of the older stacks was often quite massive, and in many cases they were constructed with such integrity that they have sustained successive enlargements of bosh and increase in hight. Some stone blast-furnace stacks are still active which are more than a century old. (The Cornwall charcoal furnace, in Lebanon County, Pa., has been an active iron-producing establishment since 1742, and ranks as the oldest plant in operation in the United States.) The openings provided for a working or forepart arch and for tuyere arches were liberal in width, but generally restricted in hight, and did not permit of elevating the tuyeres to points now considered advantageous. The tin blast-pipes and light fixtures stood all the work demanded of them, for, even where the water-power was adequate and the machinery strong enough, an old-time founder would not blow hard for fear of destroying the fuel, or, as he expressed it, of "blowing the charcoal to pieces."

While the construction of the blowing apparatus appeared cumbrous and crude, it gave evidence of careful thought and good workmanship. The wooden blowing-tubs were cylindrical or rectangular in form, from 5 to 7 feet in diameter, or square, and from 2 to 5 feet stroke. They were formed of segments or strips cut from 1-inch boards, generally pine, glued and doweled together, and then turned or planed to smooth surfaces. There are examples of both cylindrical and rectangular wooden tubs still in use. These tubs, when lined with apple or other hardwood, were very durable. Hardwood segments were also placed within tubs made from pine staves secured with bands. Large wooden pistons with leather edging were fitted in the tubs and connected with square wooden piston-rods working in stuffing-boxes. The blowing-tubs, when single-acting, had the inlet-valves in the piston, and, when double-acting, these valves were in the ends of the tubs. Some of these engines were known as "pacers," owing to the motion of the two counterweighted beams which were connected with the two blowing-pistons, but the ordinary appellation for all blowing apparatus was "the blast," whatever its design. A popular arrangement of "the blast" consisted of two vertical single-acting wooden blowing-tubs placed over opposite ends of a vibrating beam which received motion from a crank on the water-wheel shaft; the air was admitted through valves in the piston during the down stroke, and discharged into a third tub placed over the two just described; this third tub had valves in the bottom communicating with the two operating cylinders, and a large floating piston forming the top was weighted with iron to secure the pressure desired; it rose and fell with each stroke of the operating cylinders.

The output of an old-style cold-blast charcoal furnace, 9 feet in diameter at bosh and 28 feet high, was, as stated, from 3 to 5 tons of pig iron per day, the consumption of charcoal being from 150 to 225 bushels per ton. The paper on Mont Alto Furnace work, to which reference has been made in the *Journal* of the United States Association of Charcoal Ironworkers, gives the output of that furnace in 1883, with bosh diameter of 9½ feet and hight of 44 feet, as averaging 25½ tons of cold-blast iron on a consumption of 129 bushels of charcoal per ton of iron made. When hot blast was employed the older furnaces of the above dimensions increased their product to from 8 to 10 tons per day, but improved appliances and management have latterly obtained 30 to 40 tons per day from furnaces of practically the same diameter of bosh, but with larger crucibles and greater hight, and the fuel consumption has fallen to 100 bushels per ton. In larger and more modern plants of 11 feet diameter at bosh and 60 feet high, a product of 70 tons per day and a fuel consumption of less than 85 bushels of charcoal per ton have been attained.

The massive stone stack, from which the flame constantly rose and fell with the wheezing of the blast, and around which centered the entire interest of a community dependent upon its action, the battery of ore carts and charcoal wagons, with their motive-power represented by 100 braying mules, and the Arcadian simplicity of all the surroundings (save at the mansion house) were characteristics of the olden-time furnace. The neat, symmetrical furnace stacks, chimneys and hot-blast stoves, the substantial casting, stock, engine and boiler houses, the absence of flame from the tunnel-head, the puffing of small locomotives drawing ore, flux, fuel, pig iron or cinder, and the quantity of material thus handled, present a strange contrast to the charcoal furnace of 50 years ago. The above is excerpted from a paper upon "American Blast Furnace Practice," prepared by Mr. John Birkinbine for the United States Geological Survey, and to be published in "Mineral Resources of the United States."

The total grain receipts at Montreal during the past nine months were 9,365,000 bushels, and shipments 8,127,000. While the shipments of wheat show an increase of 33 per cent., the shipments of corn, on the other hand, fell off 46 per cent.

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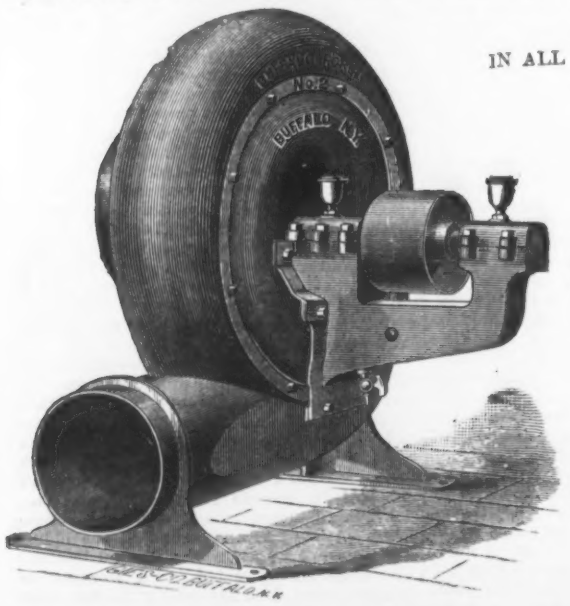

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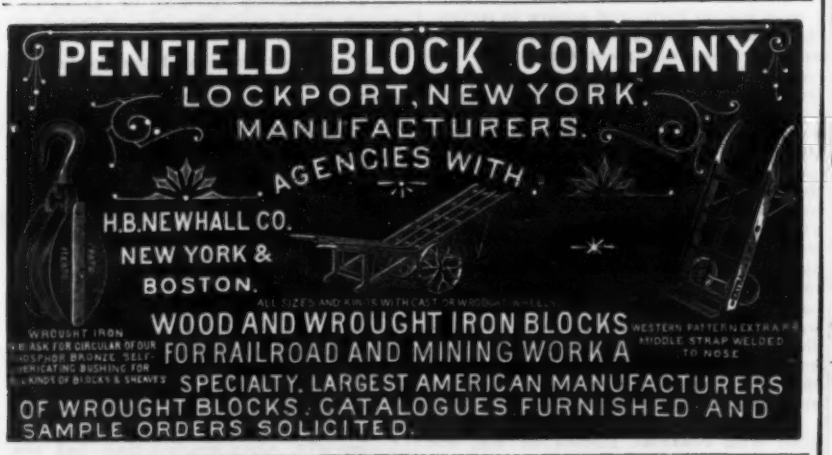

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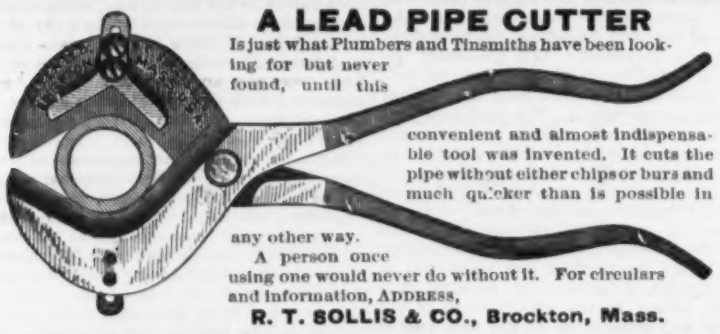

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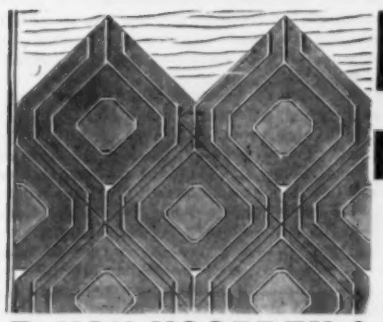

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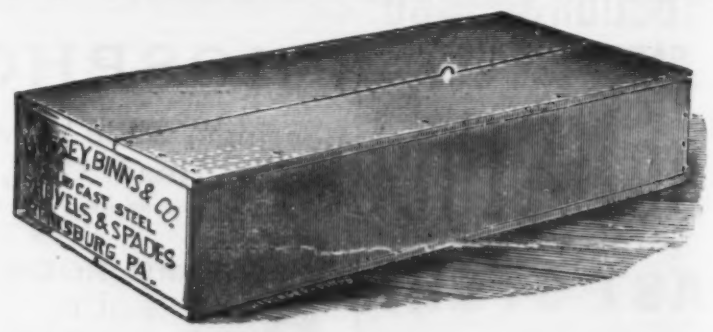

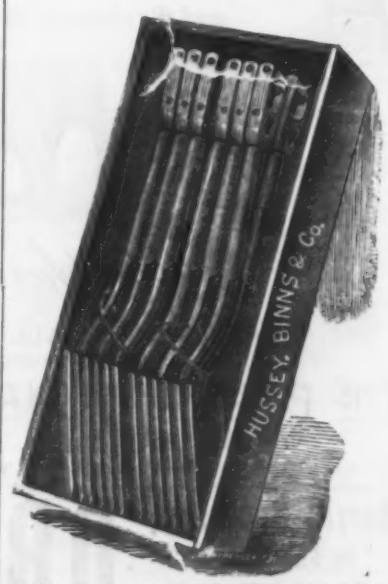

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English Letter.

(From Our Regular Correspondent.)

LONDON, SEPTEMBER 21, 1885.

THE SITUATION

is very much the same as that reported upon in my last letter, yet that it should be no worse must be counted as being a distinct gain. Something has been gained during the previous two or three weeks, and if we have maintained the foothold thus gained it has to be regarded as being a distinct achievement. You know my views as to the policy of "not prophesying unless you know." I repeat the maxim, and for the present quite decline to commit myself to the absolute statement that we are going ahead rapidly. I am prepared to state, nevertheless, that matters are mending, and that in many branches of the iron, steel and hardware industries there is a welcome process of filling up order books in progress. So far, with but three or four exceptions, there has been no recognizable stiffening of selling values, but it is clearly only a matter of time for that effect to be produced, should there be no "backwardation" in the meantime. Perhaps the most satisfactory feature of the entire situation is the fact that the orders for miscellaneous hardwares are much more numerous—indeed, I hear of agents declining to book further commissions for bedsteads, chains, cables and some other lines of goods. When this state of things has come about it is abundantly clear that excellent employment is being found for large numbers of men, besides which it is an evidence of the purchasing powers of the home and exports markets which cannot well be disregarded. In these smaller lines there is comparatively little speculation, so that the condition of such industries is a much better index to the true state of business than the iron market, which is open to many outside influences which are not always exerted in a proper manner. This week again, therefore, I have to present a report which in the main is favorable, although I am anxious that your people should clearly understand that I am no believer in a boom—either present or to come in the near future. The evidence we have shows that there is an improvement which is pretty general, even if not great, and that we are gradually acquiring work which is likely to give occupation to our works for some months ahead. There is as yet no foundation for more than fractional advances in values, but what I have chosen to term the "filling-up" is good of itself, and is one of the several conditions which, if fulfilled, can scarcely fail to lead us on to higher and better things. You still hold the key to the immediate future, and as that is the case it would be worse than useless for me to attempt anything in the nature of vaticination.

SCOTCH PIG IRON

has been somewhat lively during the week, speculators having knocked warrants up and down in their efforts to cover themselves properly. Great attention is being paid to the course of the American market by all parties in consequence of the editorial utterance to which I called attention last week, which was largely referred to as being authoritative by the newspapers, from the *Times* downward. There are now 89 furnaces at work, as against 94 a year ago, and the stock in Connal's stores is 622,000 tons, against 584 500 this date 1884. Shipments are about 84,000 tons in arrears this year. Current prices are:

Deliverable alongside.	No. 1	No. 3.
Gartsherrie, at Glasgow	46/6	44/3
Coltness, "	50/6	46/
Langloan, "	48/6	45/6
Summerlee, "	47/6	44/
Calder, "	52/	44/
Carnbroe, "	46/	43/6
Clyde, "	46/6	42/6
Monkland, "	43/3	41/3
Quarter, "	43/	41/
Govan, at Broomielaw	43/3	41/3
Shotts, at Leith	47/6	46/6
Carron, at Grangemouth	51/	47/
Kinneil, at Bo'ness	44/6	43/6
Glengarnock, at Ardrossan	46/	42/6
Eglinton, "	42/6	39/9
Dalmellington, "	44/	41/

THE IRON MARKET

has been tolerable steady on the week, taking an all-round view of the situation, and values may be said to have been fairly well sustained. As I remarked last week, a certain amount of speculation has been encouraged and developed by the newspaper paragraphing of the past 10 or 14 days, but it is probable that no particular mischief has been wrought thereby. Glasgow warrants have been the principal medium of speculation, and they have had variations which have doubtless afforded useful margins to the more experienced dabblers, but it is doubtful whether there has been any serious buying for investment on the part of the outside public. Pending the receipt of intelligence from the United States recording a sound investment in prices there, we need not expect any further considerable advance here, but the moment staple quotations are advanced in the States a good deal of activity may be looked for in Great Britain. The latest mail advices from New York, Philadelphia and other leading commercial centers speak of a decided increase in the volume of business, and on all sides confident hopes appear to be entertained in respect of the fall trade. From British North America my own advices are couched in hopeful terms; hence we may reasonably anticipate a better state of things before long. From South Africa there come improved reports, and India, with Singapore and the whole of the far East, are likely to buy more largely. Australian advices are not very encouraging, Sydney in particular being overdone with consignment goods; but those colonies are very good customers and may be relied upon to take an average supply of goods from us. In some parts of Europe the markets are a little better, although they are really waiting for their cues from this country, while orders from most parts of South America and the West Indies are somewhat larger in certain lines. The home market appears to be steady, and in some respects is yielding good results, but there is no boom, and will be none, unless it should be started from outside sources. Briefly, then, the improvement of the past fortnight or so is reasonably well maintained and the outlook, from any point of view, is distinctly brighter than it was a month ago. Order books are being filled up in a quiet and satisfactory manner, and with no relapse for another two or three weeks a respectable amount of occupation may be counted upon up to Christmas.

At Glasgow warrants have fluctuated between 42/8 and 43/4 ₹ ton, averaging about 43/, and a considerable number of transactions have been recorded, mostly of a speculative nature. In Scotch special brands business is quiet, and some quotations are about 6d. easier on the week, neither the shipping nor local demand being sufficiently large to warrant the maintenance of the higher rates asked by some of the smelters as an outcome of the rise in warrants. As a matter of fact, shipments from the Clyde are very indifferent, and are some 84,000 tons less than to the same date of last year, while the quantity of pig iron imported into Scotland from the North of England has been augmented by 82,109 tons. At Middlesboro' the market may be considered steady on last week's basis of 33/ @ 33/6 ₹ ton, but it is pretty certain that good buyers are able to satisfy their requirements at the lower limit. Shipments are good, as is usual at this season of the year, but the local consumption is unsatisfactory. Hematite pig iron is quiet at about 43/, and does not appear to be meeting with a good forward demand, owing to the quietude of some of the larger rail mills. Elsewhere crude iron is steady, but transactions are not numerous, owing to the proximity of the end of the quarter and the impression among the smelters that the quarterly meetings may bring a general stiffening of selling values. Heavy manufactured iron is in good request for engineering purposes on large contracts, but new orders are not numerous. In fencing wire there is no amelioration worthy of special mention, and the German houses still seem to have the pull. Galvanized sheets are in good request and the leading makers are all well engaged. There are rumors that the recent advance is not being invariably insisted upon, yet in a general way we think the reputable brands are 5/ ₹ ton dearer. In ordinary finished iron the business being done is on a rather more liberal scale, but in many cases negotiations are being suspended until quarter day, except in the relatively rare instances in which venders are willing to close at the late quotations. Sheets, however, are almost universally firmer and the producers of this class of rolled iron are very well supplied with orders of common and medium bars; purchases are being made by consumers and merchants somewhat more freely. Common Welsh bars in India assortments may be called £4. 17/6 @ £5 ₹ ton, while other ordinary bars range from £5. 5/ upward. Marked bars are £7 @ £7. 10/, as heretofore. Old materials are rather more firmly held in view of a possible enlargement of the United States demand, but there is as yet very little movement in that direction.

Freights are about the same, pig iron by ordinary steamers from Glasgow to New York remaining at the nominal rate of 1/6 ₹ ton. Liverpool and other rates are not firmer, although they would probably become so were any augmentation of the American demand to arise. Steel is not notably changed since my last report, but the general improvement has not been without its effect upon several departments of the industry. In converted and crucible sorts a moderate business is being transacted, while several Sheffield firms are doing well in special forgings and castings. For Bessemer rolled sorts the current call is quiet, but most of the producers of mild steel castings, sheets, plates, &c., are fully engaged, with good prospects. Steel rails are again without special alterations to note, ordinary heavy sections of D. H. being £4. 17/6 ₹ ton. A few new orders have been given out for India, &c., but some of the mills have very little work assured. Perhaps the best employed concern at the moment is that which is not within the association.

TIN PLATES.

The improvement noted last week continues; not that there is a vast amount of business doing, but that the tone is firm, because there is no pressure of plates on the market. The inquiries are very numerous, and, though nothing like the whole of these have resulted in business, yet a great many orders have been pulled through. There has been a distinct advance even for ordinary coke tins, inasmuch that there are plenty of buyers now at 14/ IC, whereas a week or two since 13/9 was the utmost figure talked of or offered for any of the general run of coke tins. The case has been reversed once more, and the difficulty is to get quotations for all the plates that are inquired for at present. The intention is to wait a little longer, in order to see the effect of the third stop week, and therefore it is considered that there must of necessity be a great scarcity of plates next week. The numerous inquiries this week have been for all classes of plates, and more especially for Bessemer steel plates and coke-tin plates, and when orders are placed for the former they fetch from 14/6 to 14/9, and the latter 14/ to 14/6 IC for ordinary good brands. The inquiries for Siemens steel plates with coke and charcoal finish, and charcoal tin and terne plates, though not so numerous as for cokes, have been for fairly good quantities. The former fetch 15/ IC easily now, and the two latter 16/ @ 17/ and 13/6 @ 14/6 IC. The orders resulting from the inquiries made for ternes are not at all in accord with the demand, but it is all a question of price, and, if sellers' prices are not paid now, it is felt to be more than certain that they will have to be paid later on, and that very soon now, the general belief being that we are now in for a steady, if slow, improvement in prices all round. There is a brisk demand for coke-tin wasters at 12/9 @ 13/, but there are none to be had under 13/3 @ 13/6.

Since 1813, pieces of native iron have been brought from Greenland by many explorers, and have in nearly every case been ascribed to meteoric origin. Steenstrup, in his third voyage to Greenland (1876–80), however, found the iron native in a basaltic rock at Asuk, in grains varying from a fraction of a millimeter to 18 mm. It is also found on the western and northern sides of Disko Island and in other places. This settles beyond a doubt the question of the origin of the Greenland native iron.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, October 8, 1885.

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Condition of the Blast Furnaces of the United States, October 1, 1885.

Our regular quarterly report as to the condition of the blast furnaces of the United States is given on the next page. Reports from four charcoal furnaces—those in Minnesota, Texas, Utah and Oregon—are missing It was deemed better not to delay the publication of the report for these returns.

In a condensed form the table makes the following showing as to the condition of the furnaces October 1, 1885:

Fuel.	In blast.		Out of blast.	
	No.	Weekly capacity.	No.	Weekly capacity.
Charcoal	62	8,056	163	15,866
Anthracite	78	20,318	144	33,136
Bituminous	88	42,254	136	51,573
Total	225	71,608	443	100,575

A month ago there were 78 anthracite furnaces in blast, with a weekly capacity of 20,190 tons, and 88 bituminous, with 42,663 tons capacity, practically no change in the month. Accompanying the reports received, however, were statements that indicate that the number of bituminous and anthracite furnaces in blast will be somewhat increased during the present month. This is in most instances due to a reduction in stocks. One Eastern furnace reports that it has sold the 10,000 tons of stock on hand (Bessemer) at $1 a ton better than could have been obtained January 1, and will blow in at once. Others report, as in Maryland, that if there has been a boom in iron or an increase in prices it has got lost before it reached them. The general reports as to stocks are that there have been more sales than in summer, but it is not believed that the increased demand will continue.

In the following table will be found a comparison of the furnaces in blast on the first of each quarter of the present year, and capacities:

FURNACES IN BLAST AND CAPACITY OF SAME ON THE FIRST OF EACH QUARTER IN 1885.

1885.	Charcoal.		Anthracite.		Bituminous.	
	No.	Weekly capacity.	No.	Weekly capacity.	No.	Weekly capacity.
January 1..	68	8,371	86	21,564	82	36,812
April 1.....	48	7,481	82	21,704	90	45,655
July 1.....	50	7,602	81	20,444	92	43,945
October, 1....	62	8,056	75	20,318	88	43,234

Compared with a year ago the condition is as follows:

Fuel.	No. in blast.		Weekly capacity.	
	1884.	1885.	1884.	1885.
Charcoal	69	62	8,669	8,066
Anthracite	86	75	23,539	20,318
Bituminous	79	88	40.410	43,234
Total	234	225	72,618	71,608

The total of furnaces in blast is somewhat less than it was a year ago, as is also the total capacity, but the capacity of the anthracite furnaces and the number in blast are considerably less, while the bituminous furnaces in blast are nine more and the weekly capacity nearly 3000 tons greater.

The following table gives the number of furnaces in and out of blast on the 1st of October for the last eight years:

FURNACES IN AND OUT OF BLAST OCTOBER 1, 1878-85.

Date.	Charcoal.		Anthracite.		Bituminous.	
	In blast.	Out of blast.	In blast.	Out of blast.	In blast.	Out of blast.
1878.....	83	186	88	185	80	133
1879.....	97	159	128	98	112	90
1880.....	153	116	143	96	128	90
1881.....	158	119	148	87	134	87
1882.....	158	93	157	72	128	111
1883.....	104	145	122	110	114	110
1884.....	69	175	86	141	79	146
1885.....	62	163	75	144	88	136

Railroad Mileage in Progress and Projected.

The *Railway Age* has come forward with a statement which holds out great promise for the future. Our contemporary, which has already earned a reputation for its promptness in printing annually early statements of new mileage, has this time undertaken to give data in regard to the amount of railway work in progress, and the mileage of railroads proposed. In its last issue the *Railway Age* prints a summary of the record prepared, covering, so far as attainable, the number and the mileage of the railroads in process of construction, organized or projected since January 1, 1885. The following is a recapitulation by groups of States of detailed figures given for each State and Territory:

States.	In progress.		Proposed.		Total.	
	No. roads	Miles.	No. roads	Miles.	No. roads	Miles.
New Engl'd.	7	202	16	611	23	813
Middle	33	688	60	1,645	93	2,333
Southern	56	2,193	122	7,221	178	9,414
Western	92	5,077	190	22,619	282	27,696
Pacific	19	1,088	31	3,049	50	4,137
Grand totals	207	9,248	419	35,145	626	44,393

The most valuable, because probably the most trustworthy, data contained in the table are those relating to the mileage in progress. Our contemporary states that 2000 miles of the roads thus classified have been already constructed during the current year. The figures given justify the conclusion that during the coming year the balance of the work now returned as being in progress will be carried to completion, or at least that the material required for it will be purchased during the next 12 months. If only a part of the 7000 miles of railroad are finished during the next 12 months, and not one of the projects come to an issue, the building season of 1886 and the buying and contracting for material preceding it will be much heavier than the average of the past two years. We are inclined to be somewhat skeptical concerning the large amount of railroad work returned as being "proposed." The *Railway Age* distinctly states that the list from which the figures have been compiled "contains only the enterprises in regard to which some activity, either in organization or construction, has been exhibited since the commencement of the present year, and does not include a very large number of undertakings of previous years which have been lying dormant, and many of which will awake to new life." Our contemporary adds, in review of its figures: "Of course some of these projected roads will not soon be built—a few of them will never be undertaken. But an examination of the table will show that the number of enterprises in most of the States is large as compared with the aggregate mileage, indicating that the greater part of the proposed roads are to be short local lines intended for the legitimate needs of communities, and generally wanted to give connection with existing roads in the vicinity or to open up regions destitute of railway facilities."

In spite of this explanation, we cannot escape the conviction that our contemporary has probably been very liberal in its construction of the term "proposed railroad." It is difficult, if not impossible, to draw the line between enterprises well backed and likely to be carried through and schemes which never get beyond the paper stage. This conviction is strengthened by the fact that as yet there has not been any noticeable movement in the placing of new enterprises in the financial centers of the country, chiefly, we presume, because any attempts of that kind have been practically labor lost. We have no doubt whatever that, so soon as there should be developed any disposition to look favorably upon new railroad schemes, a bountiful supply would be forthcoming, and it may be that far-sighted promoters are even now engaged in the preliminaries. But the lessons of the past have not been forgotten yet, and the profits of shareholders in existing railroads and the wealth accumulated by speculators have not yet become so tempting as to cause a rush into railroad building. We are willing to concede that a large share of the work "in progress," and possibly of the railroads "projected," are undertaken as extensions of existing lines; but, even making full allowance for that fact, the efforts to raise the funds for so large an amount of work would attract a good deal of attention in a financial center like New York. Until now it has not been felt. On the contrary, those capitalists who are most immediately and most heavily interested in railroad property have devoted their means to buying large blocks of the stocks of existing enterprises, and, until they have realized large profits by selling to the outside public, who still keep aloof, they cannot be expected to look with favor upon projects.

The showing of our contemporary, so far as work actually under way is concerned, is certainly the most gratifying piece of news which the iron trade has had for a long time, and the enterprise of the *Railway Age* will be generally and heartily commended; but the large figures relating to projects are, we fear, apt to raise hopes for the early future which would be doomed to disappointment. The situation does not warrent the realization of even a fraction of them in the near future.

The August Import Returns of Iron and Steel.

Mr. William F. Switzler, Chief of the Bureau of Statistics, has just issued his statement for August of the imports and exports. According to this document, the imports of dutiable merchandise have fallen off, during the first eight months of the respective years, from $306,027,301 in 1884 to $258,683,359 in 1885, while the imports of articles on the free list decreased from $132,517,663 to $121,860,918, making the total imports of the first eight months only $380,544,277 in 1885, against $438,544,964 in 1884. The returns for August alone, however, indicate that latterly the business done is more equal, the figures for August of this year and of last standing at respectively $50,408,133 and $50,662,760.

The exports, too, show a decline, though the decrease is only roughly about one-half of that in the imports. For the first eight months of 1884 their value is given at $441,431,855, while for the corresponding period of 1885 the aggregate is only $415,356,684. At the end of August, 1884, the excess of exports of merchandise over imports was $13,783,567, while at the end of August, 1885, it revealed an excess of $45,578,733. Taking merchandise and coin and bullion together, the excess of exports at the end of the periods stand $49,312,130 in 1884, against $56,310,159 in 1885.

Turning now to the imports of iron and steel for the month of August, 1885, and for the first eight months of the calendar years 1884 and 1885, we have:

Imports of Iron and Steel—Gross Tons.

	August, 1885.	Eight mos. 1885.	Eight mos. 1884.
Iron ore	39,902	287,994	377,480
Pig iron	9,921	94,430	120,979
Wrot and cast iron scrap	1,191	8,664	17,957
Steel scrap	12	1,193	4,790
Bar iron	2,938	17,248	23,555
Iron rails	.....	26	84
Steel rails	.....	1,883	2,470
Iron and steel cotton ties	3,719	11,461	8,318
Hoop, band and scroll iron	.....	91	84
St'l hoops, bds., strips and plts	181	704	959
St'l ing's, bl'ms, slabs, billets & bars	1,760	14,939	15,944
Sheet, plate and taggers iron	296	2,259	3,446
Tin plates, terne plates or taggers tin	20,542	162,166	150,890
Steel and iron wire rods	5,254	54,131	80,858
Iron and steel wire, wire rope and strand	223	1,285	1,882
Anvils, axles & iron or steel forgings	53	379	686
Iron or steel chains	62	349	675
Cutlery	$131,505	$881,836	$1,213,262
Files, file blanks, rasps & floats	2,218	29,819	28,154
Firearms	100,191	494,716	916,144
Machinery	59,642	548,327	793,529
Needles	24,788	219,186	259,746
All other manufactu's, n. e. s.	102,075	984,158	1,789,855
Total value of imp'ts of iron and steel	$2,664,621	$21,026,351	$36,325,815

Except in the case of tin plates and of cotton ties the quantities imported show a decline throughout. The imports of tin plates account for nearly one-half of the total value, having been $11,835,983 in the first eight months of 1884, and $11,359,424 in 1885. The figures show that there has been a fairly large growth in the consumption, more than offset by a decline in price. The next heaviest item is that of wire rods, valued at $2,950,323 in the eight months of 1884 and only $1,735,662 in 1885, followed by pig iron with $2,280,092 and $1,654,928 respectively.

The falling off in cutlery, firearms and machinery, too, deserves to be specially noted. A small part of the foreign iron and steel is re-exported, the total value in the first eight months of 1884 being $815,476, and in 1885 $422,777. Altogether the showing is one favorable to our home industry.

Among the imports of metals and manufactures of metals we note the following:

Imports of Metals.

	August, 1885.	Eight months 1885.	Eight months 1884.
Tin, gross tons	1,554	6,448	7,198
Copper ore, fine copper contained, lbs.	343,878	2,459,981	1,726,345
Pig and old copper, lbs	191,051	582,877	107,564
Spelter, lbs	170,352	1,965,940	2,880,191
Brass and manufactures of brass	$49,507	$200,197	$308,623
Clocks and parts of clocks	31,669	115,328	201,421
Man'f's. of copper	6,966	57,899	164,058
Lead and manufactures of lead	61,299	444,785	144,003
Bronze man'f's	57,317	351,001	384,360
All other metals, metal compositions and manufactures	138,505	863,362	1,075,084
Man'f's of zinc	2,909	22,956	59,496

Small quantities of a number of the articles enumerated are re-exported. In some instances exports of domestic merchandise of the same character are much larger than the imports of similar goods from abroad. A glance at the following tabular statement will illustrate this:

Exports of Metals.

	August, 1885.	Eight months 1885.	Eight months 1884.
Copper ore, tons	3,174	24,854	21,439
Ingot copper, lbs	2,774,496	26,107,022	10,337,794
Copper sheets, lbs	261	26,971	57,374
Quicksilver, lbs	31,806	331,160	408,422
Brass, man'f's	$6,811	$365,162	$258,516
Clocks and parts of	78,582	732,379	723,406
Man'f's of copper	7,732	76,015	69,637
Man'f's of lead	4,475	67,490	98,045
Plated ware	27,347	273,630	311,239
Man'f's of tin	11,709	95,577	106,605
Man'f's of zinc	2,450	21,059	23,074

On the whole, these figures are disappointingly small, so far as manufactured goods are concerned. Although we are among the heaviest contributors to the world's markets of copper furnace-material and of ingot, the shipments to foreign countries of goods further advanced in manufacture are very light, comparatively speaking.

Our exports of manufactures of iron and steel have fallen off considerably, being only $9,977,599 in value in the first eight months of 1885, as compared with $13,306,166 last year. The following are among the leading items:

Exports of Iron and Steel.

	Eight mos. 1885.	Eight mos. 1884.
Castings	$269,170	$206,510
Firearms	1,019,798	761,490
Locks, hinges and builders' hardware	805,293	652,805
Machinery	2,345,795	2,808,798
Nails and spikes	166,795	159,898
Printing presses	117,488	142,726
Steel rails	140,629	94,065
Saws and tools	675,745	845,663
Scales and balances	141,944	305,279
Sewing machines	1,801,697	2,182,313
Locomotives	214,247	1,762,435
Stoves and ranges	130,826	124,411
Engines and boilers	229,603	322,137
Agricultural implements	2,140,647	2,928,493

The latter item is not included in the general total of values quoted above. A large share of the decline in the value of exports is, of course, due to the falling off of the markets generally during the years 1884 and 1885. Besides this, the call for railroad material of all kinds dropped off considerably. In some items, like firearms and builders' hardware, a gratifying increase is to be noted.

Late Developments in the Spanish Colonies.

The improved prospects in Cuba which we noted early in July continue. The advance in sugar of over 1 cent per pound during the summer has been sustained, so that a goodly portion of the 550,000 tons which the island yielded for export has had the benefit of the improvement. The deficiency of about 450,000 tons in this year's beet-root sugar crop in Europe, and the probable short crop in Brazil, have encouraged Cuban planters to make ample preparations for the new planting of canes. They were fortunate in having dry weather long enough to grind to the very last the 1884–85 canes, and the new plants are prospering under an abundant rainfall. The finances of the island are also working into better shade. The Spanish Cortes passed the budget for 1885–86. It estimates the outlay at $31,169,653 and the income at $30,790,110. The Bank of Spain loans the difference. The budget includes a loan of $20,000,000, guaranteed by the Spanish Treasury, to reimburse the Bank of Spain and foreign banks for loans to the Cuban Treasury and to cover the deficit of $11,000,000 in the previous budget. The Senate at the same time approved the raising of $8,000,000 at a small percentage—payment of such loan, however, not to be guaranteed by Spain—to build railways in Central Cuba, the Cuban Treasury to guarantee the interest thereon. On July 16 powerful syndicates of European bankers made offers to the Minister of the Colonies, at Madrid, to advance $8,000,000 for Cuban railways on guarantees by both the home and Cuban treasuries. They also intimated their willingness to consolidate the Cuban debt together with the floating colonial indebtedness of Spain. Negotiations on this subject have continued, and a conclusion satisfactory to all concerned would not unlikely have been reached in August or September if the difficulty with Germany had not arisen with reference to the Caroline Islands, now fortunately in course of amicable settlement. Meanwhile, on September 4, it was stated that the Minister of the colonies was ready to make a $20,000,000 loan on behalf of Cuba. The length of railroads to be built in the island is to be 461 miles, to be finished in six years. The concession is to cover 99 years, and the Government offers to guarantee an 8 per cent. annuity on the capital advanced, with this proviso, that the Government is to receive 50 per cent. of any net earnings that may during a year exceed 8 per cent.

During the latter part of August United States Minister Foster spent a fortnight at La Granja, near Madrid, and had frequent interviews with Señor Elduayen, Minister of Foreign Affairs, on the subject of a proposed new treaty between the United States and Spain. It has since transpired that, though a treaty was not signed, an agreement was reached between the representatives of the two Governments by which the reciprocity provisions contained in the former treaty were abandoned. The new treaty is confined to reforms in the Cuban customs laws. Spain accepts the *modus vivendi* signed in February, 1844, which was contended for by the United States. The settlement of the claims of American citizens against the Spanish Government arising out of the insurrection in Cuba is provided for.

One of the chief industries of Cuba, that of tobacco in the Vuelta Abajo, and of cigar manufacture at Havana, has been suffering of late years from exhaustion and deterioration of the soil by applying bad artificial manures to it, and thus lowering the quality of the leaf. In a good many localities tobacco culture in the privileged district had to be abandoned for a time and the ground devoted to other purposes. In this manner the soil has gradually been restored to its former good qualities, so that the Vuelta Abajo fields are now regaining their former renown. The total tobacco production of the Vuelta Abajo is between 400,000 and 500,000 quintals of 100 pounds, about 67,000 acres being under cultivation. The chief and only important cigar manufactories are in Havana, and much money and care are expended in producing a handsome article. As much as $40, gold, are paid to skilled workmen per 1000 for making up first-class goods. About 17,000 operatives are employed in this manufacture in Havana alone. In 1880, before the quality suffered from the cause named, Havana exported 12,464,936 pounds of tobacco and 153,141,000 cigars.

American trade with Cuba shows the following totals for the fiscal years:

	From Cuba.	To Cuba.
1883	$42,306,093	$8,719,195
1884	57,181,497	10,562,880
1885	65,544,534	14,567,918

The decline in sugar, extending over several years, has reduced the amount 35 per cent., and, of course, the purchasing capability of Cuba for American goods has diminished proportionately.

Porto Rico is a much smaller, but more prosperous, island covering an area of only 3596 square miles, with a population of 731,648, while Cuba, with an area of 43,220 square miles, has a population only twice that of the sister colony.

Export of Porto Rico.

	1884. Tons.	1883. Tons
Sugar	95,050	76,129
Coffee	11,546	16,360
Tobacco	2,285	1,301

American Trade with Porto Rico.

Fiscal year.	From Porto Rico.	To Porto Rico.
1883	$6,104,263	$1,533,177
1884	6,890,456	2,188,609
1885	5,477,493	2,116,499

The Philippine Islands cover more than twice the area of Cuba and have a population of 5,561,232. The natives are a mixture of Malays and Kanakas, and good workmen. Soil and climate are as favorable as in Cuba and Porto Rico, and the geographical position is as valuable; hence, there are all the elements for a colony as productive as Java, slightly exceeding Cuba in size. But Spain, always bent on making the most of her pet colony, Cuba, has neglected the even more valuable distant colony.

Philippine Trade.

	Import.	Export.
1884	$15,000,000	$21,500,000
1885	19,000,000	15,500,000

American Trade with the Philippine Islands.

Fiscal year.	From the Philippines.	To the Philippines.
1883	$7,780,756	$160,354
1884	12,329,531	194,925
1885	10,076,117	128,854

The decline in the value of sugar and hemp reduced the amount we imported considerably.

Sugar Shipments from the Philippine Islands During the First Seven Months.

	1883. Tons.	1884. Tons.	1883. Tons.
To Great Britain	19,495	12,129	27,480
To United States	74,284	53,453	80,448
To other countries	21,099	15,863	13,754
Total	114,868	83,445	121,682

The hemp shipments from the Philippine Islands from January 1 to September 21 were 318,000 bales, of which to England 126,000, to the United States 109,000, and to other countries 53,000.

There are two drawbacks from which the Philippine Islands have suffered considerably of late years—earthquakes and hurricanes. Politically, there is never the slightest trouble on the main islands, but occasionally an expedition has to be sent to subdue rebellious native princes in the smaller isles. The Hispano-German conflict about the Caroline Islands will prove a positive advantage to the Philippines, inasmuch as Spain will open her eyes to the value of this neglected colony. What others covet must be worth something, and, indeed, if the Spaniards were as good planters as the owners of Netherland India, Manila might be made in 10 years from now to pay steadily $15,000,000 net annually into the needy exchequer at Madrid. But abso-

lutely nothing has been done for this magnificent possession on the high road between America, Australia and China.

American Charcoal Iron in England.

The recent shipment by the Elk Rapids (Mich.) Furnace of a quantity of charcoal pig iron to England has attracted considerable attention in iron circles and led to the discussion of certain facts in connection with the manufacture and use of iron in this country and England. This is by no means the first shipment of charcoal iron to Great Britain. From time to time attempts have been made to secure a market for our charcoal irons in that country, and consignments have been made in the hope of creating a demand. Some years since, when (as the result of our exhibits at Philadelphia and Paris) the superior character of our common-iron castings became known, it was believed to be wholly due to our iron, and a number of brands were tried, but it was soon discovered that the secret was not altogether in our pig iron, and purchases ceased. So some attempts have been made to create a market for our chilling irons for rolls and car-wheels, but English officialism is firmly set against cast wheels for railways, and a cold-blast coke iron is made that answers fairly well for chilling. In the fiscal year ending June 30, 1884, the total exports of pig iron to England were only 11 tons, with 1 ton additional to Scotland. In 1883 there were about 30 tons, and in 1882 none.—.

As is well known, but little charcoal iron is made in Great Britain, most of the iron made with vegetable fuel used coming from the Continent; chiefly from Sweden. There are at the most but five charcoal furnaces in Great Britain—one in Hampshire, two in Lancashire, one in Cumberland and one in Argyleshire, Scotland. All of these are owned by one firm, Harrison, Ainsley & Co., and none of them run regularly, their running being according to the supply of charcoal to be obtained in the neighborhood. Only about 2000 tons are made yearly. The iron, especially that from the Warsack Furnace, in Hampshire, made from Lancashire hematites containing 64 to 66 per cent. metallic iron, has a high reputation for quality and strength. From 46 to 50 cwt. of charcoal are used to a ton of iron. The coal is worth 45/ to 75/ per ton. This iron is used chiefly for malleable castings, the same purpose for which the Lake Superior pig was imported. That our irons are admirably adapted to the manufacture of malleable castings has been abundantly proved by years of use in our foundries. That they will answer the demands of English works is probable, but the question of price is the one upon whose answer will depend further importation. At the low prices at present ruling shipments may be made. Can they be when they advance to rates that this grade of iron should command?

The "free-ore" cry is being again raised, Mr. William D. Marvel, an importer of iron ore, of this city, being the champion of the old cause. In the columns of *Bradstreet's* that gentleman presents the well-worn arguments which have done service for so many times and have been presented by abler men. Mr. Marvel, who ought to know better, however, repeats a statement which should not be allowed to go unchallenged. He says:

> The tax on the ore is to-day the sole reason why so much foreign pig iron and spiegeleisen is imported. What the foreign pig-iron maker saves by having no duty to pay on ore, coal and coke enables him to make the iron and send it here. And we see now hundreds of thousands of tons of pig iron and spiegeleisen imported here and transported directly past our idle mines, idle furnaces and idle men standing by, who, were the ores free of duty, would find employment to produce the native ores to mix with the foreign ores, to quarry limestone for flux, dig fire-clay and make firebrick for use in the furnaces and to make the amount of pig iron and spiegeleisen now imported. Other now idle men in the coal regions would find employment to mine more coal and make more coke. Railways would reap the benefit of such distributed industry, and again employ more now idle men in the service of the transportation. The purchasing power of the proper wages, now unpaid, in this one industry alone, if restored, would make demands upon other industries and again employ more labor.

Assuming that it takes 2 tons of imported ore to produce a ton of pig iron, the duty on that raw material would be $1.50. Let it be assumed, further, that using imported coke there would be a further addition to duties on raw material of 75 cents, a total, therefore, of $2 25 duty on raw materials. The duty on pig iron is nearly three times that amount, so that the bold statement that the tax on the ore is to-day the sole reason why so much pig iron is imported is rather a stunning one. The imports of pig iron now have very little to do with the duty on ore. The pig iron imports include, first, spiegeleisen and ferromanganese, Scotch pig iron, a comparatively small quantity of hematite pig, and the iron consumed on the Pacific Coast. The bulk of the iron imported, excluding spiegel, is Scotch iron, which is used by our Eastern founders as a "softener." Unless the differences in price are too great, a certain quantity will continue to be used, but no one would for a moment imagine that any iron-maker would import a pound of Scotch blackband ore if the duty were taken off. The little pig iron outside of Scotch foundry pig which comes into Atlantic Coast ports are a few brands of Cumberland hematite for special open-hearth purposes, and even that small trade is being invaded by American furnaces making a specialty of producing low-phosphorus pig from foreign ores. As for ferromanganese and spiegeleisen, the foreign article is being very rapidly displaced in the Western markets by the product of the Edgar Thomson Works from Cremora ore, while the New Jersey and Passaic companies making Franklinite residues are steadily improving quality and product.

From many quarters are coming vigorous protests against the continuance of the compulsory coinage of silver dollars, raising the hopes of those who are anxious to have the dangers removed with which it threatens business. In spite of this vigorous agitation it is well not to be deceived into any false sense of security, because of the silence of those who desire to perpetuate the obnoxious system. Once more the newspapers have brought out what is alleged to be the full text of the "compromise" bill upon which Mr. A. J. Warner has been so long at work. Its provisions have been very sharply and very justly attacked, and if it has been correctly reported the pretended cure is even worse than the evil. The press, the leaders in the financial world and political parties have spoken with emphasis on the subject. It remains with the business community at large to give voice to its convictions in an unmistakable manner.

Poplar Creek Coke.

To the Editor of The Iron Age.—DEAR SIR: I have read with considerable interest the article "Tennessee Coke," written by "H. E. C.," and published in your paper of the 24th inst. While "H. E. C." may be better informed as to the geological formations in Tennessee than the writer, he is certainly in error in his judgment in regard to the coke made from Poplar Creek coal and used at the Oakdale Iron Works. The writer was frequently at the works during the time the furnace was in blast, and gave especial attention to the working of the coke in the furnace, and can safely say it answered all our expectations, carrying a burden said to be fully equal to that of Connellsville coke. That the coke made by us was perhaps not as solid and compact as Connellsville coke we do not deny, but the cause of this was that the coke was put into the ovens just as it came from the mines, in lumps frequently so large that they had to be forced through the oven openings, a peculiarity of the coal being that when the lumps became heated the coal disintegrated and slacked, as it were, like him. The coke became fingery, and, while it probably would not have borne transportation a long distance, it answered every purpose for the furnace. Several experiments were made by using only the slack coal, free from lumps. The product was a solid, compact mass of coke which would bear transportation to almost any distance and carry a burden equal to any made. The following is the analysis made by Messrs. Potter & Riggs, of this city:

	Coal.	Coke.
Moisture	1.69	0.37
Volatile matter	39.25	0.95
Fixed carbon	57.67	90.06
Ash	1.48	8.76
Sulphur	0.445	1.643

The following is a report made by Regis Chanvenet & Bro.:

	Coal.
Moisture	1.24
Volatile matter	39.83
Fixed carbon	56.12
Ash	2.85

This coal will yield 58.93 per cent. coke containing fixed carbon, 95.24, and ash, 4.76.

It will be seen that there is some difference in the analyses made by Professor McCreath, as published in your paper, and those of the above. During the past summer we had several ovens of coke made from coal mined from our new entry, which we are driving at Poplar Creek, under what is known as Big Bushy Mountain. We have had no analysis made of the coke. I send you by mail a small sample of it, by which you can form some idea of what it is.

E. C. L.

ST. LOUIS, September 30.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., October 6, 1885.

The current of sentiment indicated in the letters received within the past few days at the Treasury Department in recognition of Secretary Manning's circular of tariff inquiry show that the manufacturers, as a rule, are averse to a reopening of the tariff question at all, and their first efforts will be turned to a securement of that result. There is a well-founded suspicion that, despite the good intentions of the department, the so-called tariff reformers in Congress will get at this information and manipulate and misrepresent it, so as in some way to use it to the disadvantage of the interests of protection. Some of the correspondents, while referring in the most kindly terms to the friendliness manifested by the Secretary, declines to furnish the information on the grounds stated. Other correspondents consider the interrogatories in a speculative way in order to demonstrate the advantage of the specific over the ad valorem system as a means of preventing fraud by undervaluations or false appraisements. From present appearances the Secretary will hardly be in a position to do any more than recommend some legislation to prevent undervaluations.

TARIFF REFORM.

The American Free Trade League, at New York, has sent to each Senator and Representative a confidential circular of inquiry propounding the following parliamentary and economic conundrums:

1. Do you favor such revision of the rules of Congress as will enable public business to be done more freely?

2. Do you favor the freeing of crude manufacturing materials from duty, with a view to giving American manufacturers the world's market, and so increasing the demand for American labor?

3. Do you favor a reduction of duties on manufactured articles equivalent at least to the reduction on their materials, so that the consumer may obtain them at a lower price?

They also put the point-blank question in a declaratory form "I count myself..... [a Democrat or Protectionist].....M. C., State of.....District No......" If the observations of Senators and Representatives who have been in this city are to be taken as an evidence of the attention which this circular is receiving at their hands, the replies must be confined to a very limited number.

THE SILVER QUESTION.

The Director of the Mint is preparing his annual report on the operations of his bureau. It will contain much valuable information respecting the precious-metal product and coinage. The following are some of the salient features of the report:

Gold coin in circulation Jan. 1, 1885	$533,000,000
Gold coin in the mints Jan. 1, 1885	63,422,646
Total gold	$596,422,646
Standard silver dollars and subsidiary coins struck since February 28, 1878, date of Standard Dollar act, and February, 1875, Subsidiary Silver act, to September 1, 1885	208,259,381
In circulation:	
Half-dollars	$20,466,127
Quarter-dollars	16,012,653
Twenty-cent pieces	271,000
Dimes	8,967,818
Total subsidiary silver.	$45,747,608

There are also $30,000,000 additional of subsidiary silver in the Treasury of trade dollars, the coinage having reached $33,959,562. About $6,000,000 are believed to be still held in the United States, $300,000 have been purchased at bullion rates for coinage, and the balance is supposed to have been absorbed in the silver bullion of China. It will be shown that there are in circulation or held by the Government $917,000,000 in gold and silver. The silver question, being regarded of more immediate importance, will doubtless take precedence of the tariff. The indications now point unequivocally to an overwhelming rout of the Administration on this question. It will be shown at the proper time by indisputable authority that the country can stand $500,000,000 of silver. At the present rate of coinage the aggregate accumulation in four years will increase the stock $110,000,000.

TARIFF ACTS.

While the business sentiment of the country deprecates a reopening of the tariff question, no less than five tariff bills are already promised, with the back districts to hear from. W. R. Morrison, of Illinois; A. S. Hewitt, of New York, and R. Q. Mills, of Texas, have pet measures which will doubtless receive more or less attention. The others are mere side shows.

CUSTOMS DECISIONS.

The Secretary of the Treasury has decided that engineers' and surveyors' instruments, composed of metal and glass, are not the "philosophical apparatus and instruments" specified in Schedule N, T. I., new, 475, and, being otherwise unprovided for, are dutiable at the rate of 45 per cent ad valorem, either as manufactures of metal or manufactures of glass, T. I., new, 143 and 216.

That certain burrstone rollers or cylinders (18 inches long by 12 inches diameter), which are finished smooth on the face (not furrowed) and hung with iron flanges upon iron axles, ready to be connected with machinery or gearing, are not the "burrstones manufactured or bound up into millstones," specified in Schedule N, T. I., new, 406, but, being otherwise unenumerated, are dutiable at the rate of 45 per cent. ad valorem, under the provision in Schedule C, T. I., new, 216, for "manufactures, articles or wares * * * composed wholly or in part of iron."

That before allowing entries upon *pro forma* invoices, in the absence of duly authenticated consular invoices, collectors of customs are directed to see that the affidavit filed by the importer clearly shows that it is impracticable to produce such consular invoice at the time of entry; and he will also, whenever he deems it necessary to do so, examine the applicant under oath, and require him to produce any letters or papers in his possession touching the value of the merchandise or the purchase price thereof; and, if the evidence of non production of such consular invoice, &c., is not satisfactory, to refuse entry until other satisfactory evidence or the consular invoice is presented.

CLASSIFICATION

The Secretary of the Treasury rules that under the existing statutes it is the duty of collectors of customs to classify imported merchandise under what, in their judgment, may be the proper provision in the tariff acts, and, in arriving at a conclusion, they may very properly consider the opinion of the appraiser, but they must not allow such opinion to control when it conflicts with their own views and opinions.

RELIQUIDATION AND ENTERED VALUES.

Rewarehouse entries at the port of transportation cannot be reliquidated at a duty lower than that specified in the original warehouse and transportation entry in cases where the requirements of law as to protest and appeal were not complied with at the port of original entry. The department has no authority under the statutes to issue instructions to allow importers to reduce the usual entered values of imported merchandise. The function of ascertaining dutiable values of imported merchandise comes solely within the jurisdiction of the appraising officers of the customs.

CONDITION OF THE BLAST FURNACES OF THE UNITED STATES, OCTOBER 1, 1885.

(Compiled for The Iron Age.)

Location of Furnaces.	Charcoal.					Anthracite.					Bituminous or Coke.				
	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New England	15	4	355	11	880	1	0	0	1	160	.....	.....	.....	.....	.....
New York	14	3	245	11	890	40	3	930	37	9,540	1	0	0	1	285
New Jersey	.....	.....	.....	.....	.....	17	4	1,383	13	3,392	.....	.....	.....	.....	.....
Spiegel	32	8	570	24	1,299	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pennsylvania															
Lehigh Valley	.....	.....	.....	.....	.....	51	24	8,015	27	6,950	.....	.....	.....	.....	.....
Schuylkill Valley	.....	.....	.....	.....	.....	44	13	2,825	31	7,150	1	0	0	1	700
Upper Susquehanna Valley	.....	.....	.....	.....	.....	24	9	2,010	15	2,629	.....	.....	.....	.....	.....
Lower Susquehanna Valley	.....	.....	.....	.....	.....	37	21	5,055	16	2,595	.....	.....	.....	.....	.....
Pittsburgh	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17	13	9,630	4	4,200
Allegheny Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	0	0	4	747
Shenango Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27	5	3,030	22	7,330
Youghiogheny Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	4	1,360	2	741
Juniata and Conemaugh Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27	13	4,544	14	3,075
Maryland	15	3	265	12	830	5	1	100	4	720	1	0	0	1	140
Virginia	30	8	368	22	1,065	.....	.....	.....	.....	.....	12	5	2,151	7	2,260
North Carolina	6	1	70	5	354	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	5	0	0	5	289	.....	.....	.....	.....	.....	7	2	456	5	2,370
Ohio—Mahoning Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	18	6	3,565	12	5,545
Central, Eastern and Northern	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	20	4	1,800	16	6,960
Hocking Valley	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	3	282	12	2,320
Hanging Rock	19	7	645	12	1,115	.....	.....	.....	.....	.....	15	8	1,296	7	1,545
Miscelianeous	2	0	0	2	400	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Kentucky	6	1	120	5	455	.....	.....	.....	.....	.....	3	2	750	1	400
Hanging Rock	8	0	0	8	875	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Region and Miscellaneous	9	7	878	2	180	.....	.....	.....	.....	.....	8	6	2,620	2	980
Tennessee	6	1	25	5	432	.....	.....	.....	.....	.....	1	1	600	0	0
Georgia	11	7	1,810	4	660	.....	.....	.....	.....	.....	10	8	4,220	2	370
Alabama	1	0	0	1	140	.....	.....	.....	.....	.....	2	0	0	2	400
Indiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	6	6,000	10	5,975
Illinois	26	9	2,080	17	3,358	.....	.....	.....	.....	.....	2	0	0	2	580
Michigan	11	2	275	9	1,106	.....	.....	.....	.....	.....	3	0	0	3	1,540
Wisconsin	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Minnesota	9	1	350	8	1,538	.....	.....	.....	.....	.....	7	2	930	5	2,630
Missouri	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Utah	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Oregon	0	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	0	0	1	480
Colorado															
Total	229	62	8,056	163	15,866	219	75	20,318	141	33,136	224	88	43,234	136	51,573

The Production of Gold and Silver in 1884.

The annual report of the Director of the Mint upon the production of the precious metals in the United States during the calendar year 1884 has just been issued from the Government Printing Office. Mr. Burchard estimates that the mines of each State and Territory added during the calendar year 1884 to the world's stock of gold and silver, at their coinage value, as follows:

	Gold.	Silver.	Total.
Alaska	$200,000	.....	$240,000
Arizona	930,000	$4,500,000	5,430,000
California	13,600,000	3,000,000	16,600,000
Colorado	4,250,000	16,000,000	20,250,000
Dakota	3,300,000	150,000	3,450,000
Georgia	137,000	.....	137,000
Idaho	1,250,000	2,720,000	3,970,000
Montana	2,170,000	7,000,000	9,170,000
Nevada	3,500,000	5,600,000	9,100,000
New Mexico	300,000	3,000,000	3,300,000
N. Carolina	157,000	3,500	160,500
Oregon	660,000	20,000	680,000
S. Carolina	57,000	500	57,500
Utah	120,000	6,800,000	6,920,000
Vermont	62,000	.....	62,000
Virginia	2,000	.....	2,000
Washington	85,000	1,000	86,000
Wyoming	6,000	.....	6,000
Alabama, Tennessee, &c.,	14,000	5,000	19,000
Total	$30,800,000	$48,800,000	$79,600,000

The estimated production of gold for 1883 was $30,000,000, and with this exception the yield of gold last year was the smallest since 1848. The production of silver was $2,000,000 in excess of that for 1882, and was the largest ever made. The production of silver in California is constantly increasing, while the gold production has been diminished by the injunctions granted by the courts to prevent hydraulic mining. Increased activity in quartz mining has compensated to some extent for the compulsory abandonment of hydraulic mining. A new method of diverting rivers from their beds is being tried with much success. A tunnel is cut through the principal elevations at points along the gold-bearing streams, through which, at two stages, the waters flow, leaving a long stretch of river bed bare and in favorable condition for working. Such a tunnel is being built on Feather River, which has been for two years under construction and will require two years more for completion. The fact that two-thirds of the total gold production of California since 1849 has been the result of working by the hydraulic process makes the result of the long legal contest between the farmers and miners of California a matter of serious consequence in the present aspect of the silver question. Mr. Walter A. Skidmore contributes to this report a monograph upon gold and silver mining in California, in which he estimates that the gold production of that State will be decreased during the year 1885 by more than $4,000,000 on account of the injunctions against hydraulic mining. More than 20,000 men have been thrown out of employment, and taxable property in the area affected, nearly 7000 square miles, has been depreciated from 50 to 90 per cent. Mr. Skidmore says, however, that with the sole exception of the uncertain status of hydraulic operations the condition of mining in California may be summed up as one of unusual prosperity and great promise for the future.

Alaska still promises to become an important source of supply for gold, but until the civil government has become fully established and mining titles have been perfected no large investments of capital will be made in mining enterprises. The report says: "The prospectors have only touched here and there along the coast, and the Government has done nothing in the way of surveys back from the high-water line. With the limited knowledge of even the probable extent of ore veins on Douglas Island, properties already claimed and partly developed there aggregate in value twice the amount that Mr. Seward paid for the whole of Alaska, and Douglas Island is but one of the 1100 islands of the archipelago, on all of which there are promises of mineral wealth."

The dividends and assessments upon mining shares during 1884 were as follows:

	Dividends.	Assessments.
Alaska	.....	$3,400
Arizona	$117,500	137,000
California	1,850,948	764,350
Colorado	1,419,000	.....
Dakota	578,250	.....
Nevada	201,500	3,632,950
Mon'ana	922,000	.....
Utah	2,257,500	68,000
Vermont	31,000	.....
New Mexico	190,000	.....
Total	$7,567,698	$4,605,700

The assessments were $1,082,584 less than during 1884. The appropriation of the precious metals to industrial uses during 1884 is estimated at $14,500,000 of gold and $5,500,000 of silver, of which $12,500,000 gold and $5,000,000 silver was coin and new bullion.

The opening of the annual exhibition at the American Institute, on Third avenue, corner of Sixty-third street, took place on Wednesday of last week. There was a large assemblage when Mr. Orestes Cleveland, vice-president of the Institute, stepped upon the platform and introduced Hosea B. Perkins, who delivered the inaugural address. Mr. Perkins referred to the rapid progress, characterizing American industry everywhere, and pointed to this exhibition, surpassing its predecessors in variety and importance. The Ninth Regiment band furnished the music, and will be in attendance every afternoon and evening. Notwithstanding strenuous efforts upon the part of the managers, the exhibition has opened, as usual, with many vacant spaces and a large number of exhibits only partly arranged. No machinery is yet in motion, and it is impossible to predict as yet what this important part of the exhibition will amount to. Nevertheless, it is believed that in general features the show will be fully up to the average of past years.

THE WEEK.

The New York Chamber of Commerce, through formal resolutions, express fear that the proposed treaty negotiated with Spain and awaiting the action of Congress may work prejudicially to the interests of the United States, and call upon the authorities at Washington to make its provisions public so that there may be full opportunity for discussion.

J. R. Whiteley, director-general of the American exhibition to be held in London next year, is said to have secured the co-operation of a large number of firms in Philadelphia. Machinery of all sorts, steam engines, the cotton, iron and steel industries, electric appliances, tobacco manufacturing, wool growing and spinning, cattle raising, silver and gold mining, coal and oil getting, are among the things that will be represented.

Mr. T. H. Thornton, late secretary to the Government of the Punjab, in an article in the London *Chamber of Commerce Journal*, endeavors to show, and with much force of argument, that India can produce wheat cheaper than the United States, and can compete with us favorably in the British markets.

The failure of the Jeffersonville Plate Glass Co., in consequence of inability to compete with the superior advantages possessed by Pittsburgh in its supplies of natural gas, forms a common topic for remark. The Pittsburgh *Times* says it illustrates the fact that success in business now can be assured only by employing the largest facilities and making the most out of them through high skill and close economy. Instead of being dependent on importers at the present day, some of the best plate glass in the market is manufactured in the United States.

A leading authority on railway matters speaks of a surprising activity in railway building, particularly in the Southern States. No less than 178 lines, with a proposed aggregate of 9000 miles, are reported in the 10 States east of the Mississippi commonly included in "the South." A detailed record of the past nine months shows the total number of new roads in progress and proposed in the United States to be 626, with a total mileage of 44 392. This mileage of proposed new roads and those already in progress of construction is distributed as follows: New England States, 813; Middle States, 2333; Southern States, 9414; Western States, 27,696; Pacific States, 4137. The greater part of the proposed roads are to be short local lines intended for the legitimate needs of communities, and generally wanted to give connection with existing roads to open up regions destitute of railway facilities In the Carolinas, Georgia, Florida, Alabama and Tennessee this activity is especially notable and cheering.

A correspondent of the St. Louis *Globe-Democrat*, writing from Japan, gives an interesting account of the great tea industry of the country, and says that America is the chief and almost sole market for Japan tea. At Kobe, where the principal manufacturers are located, there are nine British and two American firms engaged in firing and exporting tea, and the estimate of the amount sent out by them this year is about equal to the 14,296,398 pounds shipped from one port last year, and valued at $3,221,481.06.

Closer business connections with Mexico are contemplated by enterprising citizens of Pittsburgh. One of the local editors says: "The first step to be taken is to make known to Mexico our capacity to supply her wants in very many respects, more especially in the line of machinery and manufactured articles required in that country."

Liberal amounts are being subscribed in New Castle, Pa., to purchase lands on which to locate the works of the Columbia Iron Co., who propose to build there.

The new iron foundry to be erected in San Francisco will have a front of 275 feet on Missouri street, and will cost $400,000. The first story will be wholly of iron.

The Boston Fish Bureau, which represent the principal fish dealers and commission merchants in that city, call upon the Government at Washington to establish such relations between the United States, the Dominion of Canada and the Province of Newfoundland as shall include the reciprocal admission, free of duties, of the products of the fisheries of these countries. They represent that, contrary to a common impression, the larger proportion of the men engaged in the New England fisheries are inhabitants of the Dominion, and that in the event of war with England they would be found in the enemy's fleet. The bureau ask: "Is it fair that we should be taxed for their support, or that a few owners of fishing vessels should reap an advantage obtained at the expense of the great body of consumers of fish in all parts of the country?"

Important action was taken by the railroad presidents who met in this city a week ago, President Roberts, of the Pennsylvania, presiding. A resolution was unanimously passed "that we hereby pledge ourselves that we will not allow any variation to be made from established east-bound rates by any officer, agent or employee of our lines, and that upon the request of the commissioner, when evidence satisfactory to him has been presented that established rates have been cut by a connecting road or its connections, even though the reduction may be made in its or their own proportion of the rate, we will withdraw all prorating arrangements, and will not accept from such connecting roads through bills or through cars, but will cause the rebilling and transfer of the property at full tariff rates from junction points, and we further agree that any agent under our control who may be shown to be quoting less than or instrumental in cutting established rates, either by rebate or otherwise, shall be discharged. Provided, that any line may withdraw from this resolution upon 10 days' notice to the commissioner or notice given at any presidents' meeting called for the purpose."

The old dry-goods firm of Bates, Reed & Cooley, which last year did a business of $12,000,000, expire by limitation December 31, and their entire stock will be sold at auction within a few days, at 12 per cent. discount for cash. Mr. Bates alone will remain in the jobbing trade. The firm have been in existence, under different names, 31 years, and never suspended business for one day.

The Argentine Republic is coming to the front rapidly. Its railroads last year carried 46 tons of horns, 461 of horse hair, 2259 of hides, 14.391 of sheepskins, 548 of various skins not classified, 3942 of grease and tallow, 1956 of bones, 62,499 of wool, and 5 of feathers; in the line of agricultural products, 3315 tons of bran, 1746 of barley, 19,457 of grass and hay, 24,916 of flour, 13,144 of linseeds, 19,563 of corn, 121 of peanuts, 2619 of turnips, and 77,150 of wheat. Miscellaneous business consisted of 47,045 tons of provisions, 133,256 of building material, 38,654 of live stock, 16,074 of hardware, and 28,795 of timber.

Business in rolling-mill machinery, according to the statement of a Pittsburgh firm, is very good. "There is plenty doing," said the speaker, "and we would not growl were prices improved proportionally. But that will come along; as soon as one establishment makes a break in the line toward better figures the others will follow quickly."

According to the reports of American consuls to the State Department, licorice can be cultivated successfully in California, Texas and most of the Southern States. The United States last year imported 40,000,000 pounds of the root, valued at $800,000.

Mr. Page, Chief Engineer of Canals in the Dominion, is engaged in preparing plans for the proposed enlargement of the Welland Canal, to admit vessels drawing 14 feet of water. The execution of the work will occupy a period of two or three years, and the estimate cost is $1,000,000, for which an appropriation was made last session. Tenders will be called for before long. The first will be for heavy timber for the lock gates; then will come the elevation of the embankment on one level, dredging on another, and the stonework.

Pinkerton's Detective Agency have issued a circular to all employers of labor, volunteering their services in settling labor disputes. The method will be to obtain information by supplying applicants with "a detective suitable to associate with their employees."

Plans have been approved by the Philadelphia Council for a new county prison, to cost $1,035,000.

Messrs. C. G. Hussey & Co., of Pittsburgh, Pa., recently rolled six sheets of copper measuring 115 x 165 inches, and weighing 6 pounds to the square foot, which are probably the largest sheets of copper ever rolled.

The town of La Plata, in the Province of Buenos Ayres, comprises 500 houses built in Brooklyn and Chicago under a Government contract awarded to parties in New York, but the work was so hastily done that "they do not wear very well, and every roof leaks like a sieve." The Government spent $2,000,000 or $3,002,000 in the enterprise.

The usual fall activity in real estate in New York City is not yet strongly developed this season, but the volume of business done is gradually increasing, and the market is considered healthy. High-priced properties must naturally feel the recent depression, and owners and landlords generally are not encouraged in the expectation of as high rates of interest on their investments as in former years.

The improvement of Hell Gate Channel was estimated to cost $5,000,000, of which up to the present date $3,500,000 have been expended. The work on Flood Rock alone costs a round million. The great explosion, which is announced for Saturday, will for a time lessen the depth of water by throwing up large fragments of rock above their natural level, but within a year the entire *débris* will be removed to the depth of 26 feet.

An English colony will arrive next month, to settle upon 20,000 acres of land lately purchased on the St. Lucie River, Fla.

The earnings at Sing Sing Prison for the month of September were $19,860.92, and the expenditures $14,086.64, a profit for the month of $5774.28, and a total profit for the year of $73,002.31.

A new mill will be built next year by the Amoskeag Mfg. Co., to supply a lack in the spinning department. It will be nearly as large as the Amory Mill, and is estimated to cost $700,000, and will employ some 600 hands. Its extreme length will be 500 feet, width 100 feet and its hight four stories.

When we read of the agricultural resources of Russia, a comparison is usually made of its relation to America as a wheat-producing country. In fact, Russia is not a large wheat producer compared with its production of other cereals, yielding but a little over 12 per cent. of the total crop, while of rye there is 38 to 40 per cent., and oats 30 to 33 per cent. But in exporting she disposes of 40 per cent. of her wheat crop, and only 25 and 18 per cent. respectively of her rye and oats crops.

The obsequies of the late Dr. Garrett B. Linderman, of Bethlehem, took place on the 1st inst. The bell in the tower of the Lehigh University was tolled during the passage of the funeral procession, and the works of the Bethlehem Iron Co. were closed. The officers and employees attended in a body, besides many people from Bethlehem, South Bethlehem, New York, Philadelphia, and from all the cities and towns in the Lehigh Valley. The pall-bearers were Hon. Henry Green, of Easton; A. N. Cleaver, Robert H. Sayre, William Sayre, Dr. R A Lamberton, W. W. Thurston, H. Stanly Goodwin, Prof. William H. Chandler, Samuel Adams, of South Bethlehem; Henry G. Borhek, Bethlehem; John Mason, New York; Hon. Robert Klotz, John Taylor, Mauch Chunk; Charles Hartshorn, of Philadelahia.

At Columbus, Ga., the other day a cotton bale from which smoke was issuing was cut into, when the center was found to have a black, scorched appearance, though no fire was visible. The odor of linseed oil was strongly perceptible, from which circumstance it was surmised that in ginning the cotton greased saws had been used.

It is stated that the report of the Manhattan Elevated Railroad Co. for the year to September 30, 1885, shows that the number of passengers carried was 103,342,242, an increase as compared with the previous year of 6,639,622. The gross receipts were $7,004,461, an increase of $278,101, and the operating expenses diminished $130,000. Otherwise stated, the passengers carried on this road during the year numbered about twice as many people as there are in the United States.

The Cape of Good Hope is now gridironed with railroads comprising 1662 miles, on which the expenditure represented is nearly $74,000,000. The income nets about 3½ per cent. on this investment.

The New York Chamber of Commerce have adopted resolutions in spirit similar to those recently passed by the Maritime Exchange, setting forth "that the Government should without delay come to the aid of our shipping interest by some form of legal action, otherwise this chamber fears that, should the contingency arise that our naval strength should be required, we should be found without seamen, without mechanics skilled in the art of shipbuilding, and without ships, all the principal paying parts of ocean commerce occupied by foreigners, rendering it impossible to leave our shores except under cover of a foreign flag." Captain Snow, who moved the resolution, himself a large shipowner, and until lately an opponent of subsidies, now favors a bounty system similar to that of France.

A steam bicycle is the latest novelty, invented by L. D. Copeland, of Arizona. It is of the star pattern, with a small wheel in front, and attached to the front bar is a vertical brass boiler heated with gasoline. A dainty engine mounted on the bar above the boiler has a stroke of 3 inches, with a cylinder $1\frac{1}{16}$ inches in diameter. Below the engine is a spherical reservoir holding a quart of water, and above it a cylinder holding as much gasoline. A round belt communicates the power of the engine to a 30-inch wheel attached to the wheel of the bicycle. The engine, in an exhibition at Newark on Friday, made 180 revolutions of the 1½-inch crank in a minute, and nine of these revolutions turned the large wheel once. A little steam-gauge showed 60 pounds pressure a few minutes after the fire had been started, and, leaping into the saddle, Mr. Copeland rode swiftly around the rink for 20 minutes. The inventor said the engine would run for an hour without renewal of water or gasoline, and that engine, boiler and fuel did not add more than 20 pounds to the weight of the bicycle. He has retained the pedals on the machine, and he used them as an auxiliary to the engine when he pleased.

A Mechanics' Home is about to be established in Philadelphia. Provision for it was made nearly 30 years ago by Mr. George Hayes, a jeweler, who left a sum of money for the purpose of founding a retreat and home for disabled or aged and infirm American mechanics.

It is reported in London that the Atlantic cable managers propose a reduction of the present cable tariffs between England and the United States from 24 cents to 12 cents on ordinary or commercial messages, and from 12 cents to 6 cents on press messages. They urge that the opposition of the Mackay-Bennett cable must be ended by annihilation.

Besides the gigantic tower which M. Eiffel proposes to erect for the Paris exhibition of 1889, M. J. Bourdais has presented to the French Society of Civil Engineers a project for a columnar tower of masonry 984 feet in hight, in which to establish a permanent museum of electricty as far up as 216 feet, and above this a six-storied column surrounded by a roof forming a promanade and capable of accomadating 2000 persons. The central core, 60 feet in diameter, is to be surrounded with an ornamental framework faced with copper.

American competition continues to press the English land owners, the price of wheat in the London market having recently touched within 8d. of the lowest average, recorded in November last. Where lands are in tillage the rents are affirmed to represent only about "prairie value" over and above a fair interest on the owner's outlay for buildings, drains, roads and fences.

Iron and metal men are not indifferent to the system which may be adopted for laying electric wires underground. The president of one of the principal companies claims to have neutralized the evils of induction in his cables by surrounding each of his insulated wires with copper foil and then covering the foil with an insulating material, by providing a metallic circuit for the force of induction to expend itself upon. His cables are inclosed in lead pipes. For a subway he proposes to lay cast-iron pipes of suitable diameter, with connection-boxes at every second street corner, and draw into these pipes a suitable number of cables. In other quarters electrical subways of concrete are advocated.

Child labor in the Pennsylvania coal mines and breakers at such large centers as Tamaqua, Mauch Chunk and Pottsville is fast disappearing under the new State law prohibiting its employment, and in the bituminous regions it will very soon practically cease.

Lieutenant Wissman, who has been exploring the banks of the Kasai River, down to its junction with the Congo, reports that the entire region is more thickly populated than any other portion of Africa, and covered with vast forests of india-rubber trees, besides being rich in ivory.

A cotton printer formerly employed in the Fall River mills returned recently, after a sojourn of eight years in India, where he has charge of 1200 men, and reports that the great difficulty there, as here, is a lack of demand for the products.

A special received in Birmingham, Ala., says the English capitalists who recently invested largely in mineral lands in Talladega County have shipped a plant for a furnace to be erected on these lands. The same plant was recently blown out in England, so its coming to Alabama is regarded as especially significant.

Returns of the State census of Massachusetts, just taken, give Boston a population of 390,406—188,101 males and 204,305 females. The total shows a gain of 27,870 in five years.

Sir Henry Bessemer has patented a method for running out tin plates miles long if necessary, just as papers are run off on the improved presses.

One of the large English war vessels, the Resistance, is to be coated with india-rubber to a considerable thickness, to see how that material will repel projectiles.

An observer in Pittsburgh says the pressure of natural gas is beyond control, and 50,000,000 cubic feet of the apparently endless supply go to waste every day. Especially is the pressure great on Sundays, when the furnaces are shut down and the consumption lessened. At such times the pressure is relieved by letting the gas escape through tall iron pipes, whence columns of flame shoot high into the air.

Thomas A. Edison, the inventor, has notified Prof. Robert Thurston, the director of the Sibley College of Mechanic Arts of Cornell University, that he proposes to present the school a complete electric-lighting plant for the new workshops and the mechanical laboratory. The University has accepted the gift.

The Commissioner of Labor in the Saginaw lumber region makes a careful estimate of the losses caused by the strike of last July and August, and shows that the loss to wage-earners resulting from the stoppage of 76 mills was $350,000.

The Gulf, Colorado and Santa Fé Railroad Co. seek to control the ocean trade of Texas, and with this object have purchased a valuable water front at Galveston, to which they will remove their terminus and erect extensive wharves, elevators and warehouses.

A dozen or more ships now in this port are awaiting a decision from Washington of the question whether old sheathing stripped from vessels shall be admitted free, as heretofore, or compelled to pay 3 cents per pound duty. If duty must be paid, they will depart and have the work done in foreign ports, and our metal dealers, dry-dock men and mechanics will lose the trade and work they would otherwise gain.

The shafting manufactory connected with the Valley Rolling Mills, at Youngstown, Ohio, was burned to the ground on Sunday morning. The fire caught from the carelessness of the engineer with a torch. Large orders were booked, and a large amount of manufactured material was on hand. This was all destroyed, with the machinery. The loss will be at least $10,000; insured for $4200. The mill will be rebuilt at once.

The new iron ferry-boat Hopatcong, belonging to the Hoboken Ferry Co., is nearly ready for service. She was built by Ward, Stanton & Co., of Newburg, and is remarkably strong. He hull is of iron, 200 feet long, 28 feet beam and 13 feet deep. The plates composing her garboard streaks are ¾ inch, those at the water-line ⅝ inch, and above that ⅜ inch in thickness, and the frame to which they are riveted is strengthened on each side by three bilge or rider keelsons. She has two collision water-tight bulkheads about 30 feet from each end, and between these the whole length of the hull is a course of belt frames 12 feet apart, made of double angle iron 13 inches in thickness in-board, making the top as well as the lower part of the hull proof against a broadside blow.

A destructive fire broke out on Monday night in the machine shop of Taylor, Falconer & Taylor, in Jersey City. O'Donnell's cooperage storehouse adjoining, and Gokey & Son's dry-docks and tool-house, also took fire. The J. R. Thompson Co.'s Steel Works barely escaped, and the docks were saved in a damaged state by sinking them. The other property described was burnt, causing a loss estimated at $75,000, of which about $25,000 is on the machine shop, partially insured.

Crop prospects in the South are fully indicated by eight columns of reports in the New Orleans *Times-Democrat*. Corn is very abundant in the States and the yield reported as the largest ever grown. Sugar and rice are equal to last year on a smaller acreage, and the injury to rice by rain is very much less than the gloomy prospects indicated a little while since.

Signor Cocard, of Turin, is visiting New York to awaken interest in the proposed exhibition of American products and manufactures at Rome, under the auspices of the Government. He says at present there is little direct trade; that, indeed, mercantile Italy is almost unknown here.

A dispatch from Berlin says that the powers have all agreed to advise the Porte to recognize the union of Roumelia and Bulgaria under the suzerainty of the Sultan.

The great oil dock at South Brooklyn has just been completed by Warren Rosevelt, and is said to be the largest work of the kind in New York or vicinity. Its dimensions are 2260 x 25 feet wide, and in its construction there were used 20,000 pounds of bolts and spikes and 8000 spruce and pine piles.

Paper manufacturers report that goods are moving off more freely from dealers' hands, and that orders are in better supply, giving hopes of some little improvement in prices should the demand continue.

The Daft electric motor, with two cars attached, made its second public appearance on Monday evening on the Ninth-avenue elevated railroad, and started from Fourteenth street, making good speed without interruption. As the train neared Twenty-third street the electric-power was increased, and the train rattled by the station at a high rate of speed, the assembled crowds on the street corners cheering lustily. Fiftieth-street station was reached in 6¼ minutes, and the motor, detached from the cars, ran up on the long switch. After a slight mishap of no importance, the train started on its down trip, and reached the Fourteenth-street station in 5 minutes and 40 seconds. All present seemed well satisfied.

Mr. Lewis Colwell, who has for many years been prominent in the lead and iron trades, died on the 4th inst. at his residence on West Twenty-eighth street, in this city. He was born in Putnam County in 1814, and came to New York as an apprentice in the iron works of Dunham & Browning when about 12 years old. He rose to be superintendent of the works, and while there demonstrated the possibility of using anthracite coal instead of charcoal in smelting iron. About 1843 he started in business on his own account, and made part of the castings for the Croton Water Works and much of the ironwork for the Crystal Palace. During the war he was connected with the building of the monitors Weehawken and Tecumseh and the Stevens Battery, and later on he established the iron works at the foot of West Twenty-seventh street. Then he organized the Colwell Lead and Shot Co., of which he became treasurer, but continued to devote his attention to his iron works. His wife survives him, and he also leaves three sons and two daughters.

The silk-manufacturing industry of Switzerland is in such a precarious condition that many of the establishments are closed and others are preparing to move to the United States, where their goods are mostly consumed. Schwartzenbach Lantis, of Zurich, employs about 400 looms. Two years ago he put up a small factory of 125 looms at Union Hill, in Hoboken, as an experiment, and he is now determined to put up additional works to the extent of 400 or 450 looms. He proposes to put up a twisting or winding mill and also dye works. The twisting for his Zurich works is done in Italy. Another firm, that of Bodmer & Hurlimann, of Zurich, the second largest in Switzerland, have made a similar decision. Both of these firms are waiting, however, to see what action Congress will take with reference to the tariff. If the duty, which is now 50 per cent., is left at that amount or not reduced below 30 per cent. they will make the transfer of their works.

THE

Iron Age Directory

AND

Index to Advertisements.

Special Notices.

RECENT BOOKS.

West.—Moulder's Text Book; being Part II of American Foundry Practice. By Thomas D. West; 146 illustrations, 461 pages, 8vo, cloth. - - - - $2.50

This volume, in connection with the author's previous work entitled "American Foundry Practice," affords a thorough presentation of the latest and best methods of foundry practice. Beginning with articles on sound casting and defects in structural castings, the various chapter headings include Progress in Molding; Novelties in Foundry Practice; Geometry in the Foundry; Procuring Clean-Finished Castings from Dry Sand and Loam Molds; High Art Molding in Loam and Dry Sand; Manipulating of Cores; Procuring Clean-Finished Castings from Green Sand Molds; Methods and Rules for Green Sand and General Molding; Elements and Manufacture of Foundry Facing; Welding Steel to Cast Iron and Mending Cracked Castings; Foundry Addition; Ovens and Pits; Ladle and Casting Carriage Combined; Making Chilled Rolls and Roll Flask, Runners and Gates; Molding Machines; Equivalent Areas for Round, Square and Rectangular Pouring Gates; Errors in Figuring Weights of Castings; Utilizing Cast Steel Scrap; and several contributed chapters on melting small quantities or iron, making a curved pipe from a straight pattern, making pipes on end in green sand, three ways of making an air vessel and a method of molding gear-wheels. The subjects of Cupolas and their Construction, and the Melting of Iron, are extensively treated. There are also included 46 reports of cupola workings collected from 30 States. Each firm's name and the line of castings made are given, making these reports valuable in giving so many different men's ideas and practice in mixing and melting iron.

Brown, G.—Water Closets; A Historical, Mechanical and Sanitary Treatise. $1.

Waring, G. E.—How to Drain a House; Practical Information for Householders. $1.25.

Stephens, W. P.—Canoe and Boat Building for Amateurs. $1 50.

Sent, postpaid, on receipt of the price by

DAVID WILLIAMS,

Publisher and Bookseller,

83 Reade St.. - New York.

AUCTION SALE.

Postponed to Friday, Oct. 16, 1885.

The following Rolling Mill Machinery, corner Archer and Ashland avenue, Chicago. Machinery subject to inspection before purchase:

1 Train of Lauth's 24 in. 3-high Rolls.
1 Train of 2-high 22-in. Plate and Sheet Rolls and Duplicate Rolls.
1 Train of 20 in. Soft Rolls and Duplicate Rolls.
1 Compound 18-inch Muck Train and Duplicate Rolls.
1 Large Engine, 32 x 42, horizontal, 30-ton fly, doubly-braced wheel, 12 in. face
1 Large Rotary Squeezer for 150-lb Ball.
1 Large Roll Turning Lathe for Turning up Rolls.
1 Large Pump.
2 Large Cranes for Handling Housings and Rolls.
1 Plate Shear to shear as high as ¾-in Plates.
1 Shaping Shear.
1 Muck Shear.
1 Scrap Shear and Engine.
1 Large Sturtevant Blower and Pipe.
Furnace Plates for 4 Charcoal Fires, including Valves &c.
1 Battery of 3 extra flange Fire-box Boilers; size 28 ft. by 42 in; 2-flue, 16 in., to operate together or separate; with all connections.
1 Large Boiler, fire-box metal, 36 ft. by 42 in. or 44 in.
4 Small Boilers, 22 ft. by 42 in.
1 Track Scale, Wagon Scale, Mill Scales, Tools, Tramways, Patterns, &c.

Terms, one-third cash; balance, time payments. For further particulars, call on or address

JOHN M. AYER,
Room 28, 187 Dearborn st., Chicago.

The Valuable Mill Property

belonging to the estate of Calvin W. Shattuck' deceased intestate, consisting of a Cotton Mill for 216 looms, nearly new and in good repair; a Saw Mill, Grist Mill and Machine Shop, with all the Machinery in said Mills and shop, will be sold at public auction at the store of C. W. Shattuck & Son, in Snattuckville, Coleraine, Franklin County, Mass., on Tuesday, October 27, at 10 o'clock a. m. The water privilege is one of the best in the county. For particulars inquire of the undersigned at Greenfield, Mass.

GEO. A. KIMBALL, Admr.

October 6, 1885.

FOR SALE.

One Rolling Mill Steam Engine, 24 x 36, with 30-ton Fly Wheel. One Locomotive Boiler, 100 Horse-Power. One 18-inch, one 12-inch and one 9 inch Trains of Rolls. One Steam Hammer, 14 x 24 and one 11 x 14, all built by Bement; and five pairs of Shears. All of the above property is in first-class condition. For particulars, apply to

J. LEONARD,
445 West St., New York City.

NOTICE!

WANTED TO BUY

STEEL & IRON SCRAP

WROUGHT SCRAP IRON, OLD RAILS, TIRES AXLES, TURNINGS, BORINGS, BURNT IRON AND ALL KINDS OF STEEL SCRAP.

SCOTT & SMEDLEY,

STEEL AND IRON MERCHANTS,
435 WALNUT STREET, PHILADELPHIA, PA.

FOR SALE.

One Boiler-Makers' Punch (Kent's patent), 24 inch Gap; capacity, ¾-inch hole through ⅝-inch iron. Has been but little used, therefore a bargain.

DANIEL KELLY,
51 North 7th St.,
Philadelphia, Pa.

A GENTLEMAN at present occupying a responsible position as manager of a large New York house, having had 20 years' experience as organizer, correspondent, buyer and salesman, with acquaintance through entire country in Hardware, would like to make some desirable business connection in the South, with a view to permanent residence.

Address BUYER & SALESMAN,
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

Receiver's Sale.

THE Receiver of the E. T. Barnum Wire and Iron Works, of Detroit, Michigan, will offer for sale at auction, on October 15th, 1885, at 10 o'clock a. m., at the factory of said Company, in said city of Detroit, subject to confirmation by the Court, the property described below, which will be offered in lots or parcels, as follows:

1. The Real Estate, Factory and Buildings, with the Appurtenances, including Engine, Boilers and Connections, Steam Heating Pipes and Plumbing Work, Elevators, Bridges, Shafting, Hangers and Pulleys, in one lot or parcel, subject to the rights therein of David Whitney, Jr., under his certain contract of April 27th, 1883. The Real Estate consists of twelve lots, situated at the corner of Howard street and Wabash ave. with an alley on the west side. The Factory is new and a substantial brick building, containing three stories and basement, and is built on three sides of a square. It is 141 feet front on Howard street, 300 feet on Wabash avenue, and 200 feet on the alley, and has a floor space of about 124,000 square feet, all well lighted, heated and ventilated. In addition there is a blacksmith shop 50 x 75 feet, and a boiler-room 25 x 30 feet. The engine is 160 horse-power, and there are two boilers of capacity to supply the engine; there are about 1180 feet of line shafting; the switch track of the N. C. R. R. extends into the area between the two wings of the building. The estimated value of this property is upward of $100,000. The lien of Mr. Whitney is $50,000 and interest from July 1st, 1885, and is payable in yearly installments of $5000, commencing July 1st next.

2. The Machinery, Machines and their appliances, Reeds, Belting, Tools, Implements and Patterns in one lot or parcel. This item consists of several Power Looms and Hand Looms for weaving Wire; Punches, Drills, Planer, Lathes, Shears, Crimping Press and Machines, Circular Saws, Grindstones, Frizzing Machines and a large lot of small Machines and Tools; all of the estimated value of about $10,000.

3. The stock of Goods, Merchandise and Materials on hand, consisting of a large quantity of Wire Cloth, Wire and Iron Goods and Wire, and of materials for manufacturing Iron Fence, Stairs, Jailwork, Elevator Guards, Fire Escapes, Balconies, Vault Doors, Cresting, Railing and various kinds of Iron and Wire Work, and a considerable quantity of Hardware Merchandise; all of the estimated value of upward of $100,000, and to be sold in one lot or parcel.

Also a small quantity of Lumber, three Horses, Trucks, Wagons and Harnesses, and a large quantity of Woodcuts and Electrotypes for Catalogue purposes, and the Stationary on hand and Office Furniture.

ABRAM L. STEBBINS, Receiver.

MACHINERY, SECOND-HAND.

10 x 24 Corliss Engine.
10 x 24 Allen " "
18 x 30 Wright " "
22 x 48 Woodruff & Beach Engine.
11 x 22 Slide Valve Engine.
12 x 24 " "
14 x 30 " "
15 x 18 " "
6 x 12 Hoisting Engine.
Otis Belt Elevator, 3000 lb. lift.
Horizontal Tubular Locomotive and Upright Boilers. All sizes Steam Pumps, Tanks, Steam Hammer 4½ x 12 cylinder, Ferris & Miles make, Elevator Engines, Blowers and general machinery.

WILSON & ROAKE,
Front and Dover Sts., New York.

For Sale.

Foundry and Machine Shop in a growing town in the Naugatuck Valley, doing good business and only Foundry in the place. Reason for selling, other business.

Address BOX 748,
Birmingham, Conn.

FOR SALE.

A flourishing Hardware Store, with fine selected stock, in thriving Eastern manufacturing town of about 7000 inhabitants. The best reasons for selling.

Address "BUSH HAMMER,"
Office of *The Iron Age*, 83 Reade St., New York.

For Sale.

First-class Hardware Stock in a live town of Southern New England; 8000 inhabitants; one of the best fitted stores for Hardware trade in the State; centrally located near Post Office; stock clean and desirable; no old goods. A fine chance for an energetic man. Satisfactory reasons for selling. For particulars, address

"NEW ENGLAND,"
Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

LARGE PLATE SHEAR for heavy and wide Iron and Steel Plate. Address "L. P. S.," Box 1547, Pittsburgh, Pa., stating thickness and width it will cut, where it can be seen, and price on cars at the place where it lies.

Wanted.

A first-class Die Sinker for cutting name stamps, &c.

Address BELLOWS & DICKEY,
833 to 839 Sheriff St., Cleveland, Ohio.

WANTED.

Sales Agents traveling in New York and Northern Pennsylvania, among Hardware and Stove Dealers, to take a line of saleable goods. Correspondence solicited.

Address "E. C. S. & CO.,"
Office of *The Iron Age*, 83 Reade St., New York.

WANTED.—Situation by a thoroughly practical Mill Manager with twenty years' experience in the manufacture of Steel Plates and Bars. Good references.

Address "IRON AND STEEL,"
P. O. Box 12, Joliet, Will County, Ill.

WANTED.

An 18 or 20 inch Screw-Cutting Engine Lathe, 8 or 10 foot bed; good order. State price, maker's name, how long used.

Address POST OFFICE BOX 1787,
Bridgeport, Conn.

Canvassers Wanted.

First-class men to solicit orders for an Improved Covering for Steam Boilers and Pipes. Liberal arrangements made with live men.

Address "B. C.,"
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

Second-Hand

MACHINERY.

1 Engine Lathe, 92-in. swing, 20-ft. bed, with Back Face Plate for Pit work.
1 7 ft. swing Engine Lathe, 10 ft. bet. centers.
1 Engine Lathe, 7-ft. swing, 10 ft. bet centers.
1 " 48 in. swing 24 ft. bed. Cheap.
1 " 33 " 10½ " Pond.
1 " 27 " 18 " Heavy.
1 " 27 " 14 " Heavy.
1 " 21 " 12 "
1 " 19 " 7 " Whitcomb.
1 " 18 " 7 " Gould
1 " 12 " 5 " Gould.
1 Lathe 18 in. x 7 ft Old style. Very cheap.
1 Iron Planer, 42 x 42 in x 12 ft. New Haven.
1 " 32 x 32 in x 9 ft. New Haven.
1 " 30 x 30 in. x 8 ft Bigelow.
1 " 24 x 18 in. x 4 ft. Fre-land.
1 " 24 x 24 in. x 5 ft. New Haven.
1 " 20 x 20 in. x 4 ft. Bishop.
1 Lincoln Milling Machine.
1 28-in. D fill, wheel feed, back geared. Gould.
1 36 in. " Old style. Cheap.
2 15 in. Drills, wheel feed. New.
4 Blacksmith Post Drills.
1 2-Spindle Drill. Fine. New
1 12-in. swing, 4-ft. bed, Hand Lathe.
1 10-in. " Hand Lathe.
1 Upright Boring Mill, 52-in. swing x 24 in. high.
1 Pulley Hub Drilling and Tapping Machine. New.
1 10-in. Alligator Shears. Heavy.
1 Alligator Shears, 6-in. Jaw.
1 Hand Bar-iron Shears.
1 No 42 Bliss Power Press.
2 No. 2 Otis Presses. Wheel 24 x 3½ in. New.
1 No. 4 Merriman Power Press New.
1 Heavy Screw Press, 3-in. diam. Screw.
1 Ferracute Screw Press.
1 Small Screw Press.
10 Foot Presses, various sizes.
1 Hand Punch, ¾-in. hole in ¼ in. Iron.
1 Drop Press, 7-ft. guides, 12-in. space, 120-lb.
1 Hydraulic Wheel Press.
1 Double Head Bolt Cutter.
1 Durrell 7-Spindle Upright Nut Tapper.
1 100-lb. Jenks' Patent Vulcan Power Hammer.
1 40-lb. Bradley Hammer.
1 60-lb. " "
1 Shaw & Justice 50-lb. Dead Stroke Hammer.
1 Alden Stone Crusher, No. 6.

The above are all in first-class condition, and will be sold at very low figures.

Have also a lot of new machinery for sale at bottom prices.

This list is changed every week, and if it does not contain what you want, write us, stating particulars. Machinery bought, exchanged, or sold on commission.

Badger & Stetson,

49 Dey St., New York City.

THE Citizens of Roanoke, Va., offer to subscribe one-half of the capital stock necessary for the erection and operation of a Rolling Mill for the manufacture of Merchant Iron or Steel The other half of the stock to be subscribed by parties competent to manage and operate the same. Roanoke is an unusually desirable place for the location of such a Plant, and the city offers special inducements to any Manufacturing Co. that will locate within its limits. For particulars address

E. H. STEWART,
Chairman Committee.

HOISTING ENGINES.

New 10 H.-P. worm-geared Hoisting Engines; Steam Cylinder 6 in. bore, 8 in. stroke; geared 16 to 1; Drum 20 in. diameter, 18 in. long Improved Cone Friction for Hoisting and Lowering. Also 6 in. x 6 in. Williamson Spur-Geared Hoister, with Clutch and Link Motion. Drum 8 in. x 16 in.

A. G. BROOKS,
261 N. Third Street, Phila.

Wanted, Capital.

Wanted, one or two parties with from $15 000 to $20,000 each to join the undersigned in the manufacture of Cast-Iron Gas and Water Pipe, and making Steel from Foundry Cupola, under a new patent. My plant is very favorably situated with regard to cheap Iron, railroad facilities, side tracks, &c.; embracing ten acres, with buildings covering a half acre. Good Coal is delivered at 90 cents per ton. Excellent Sand and Clay on the premises for all purposes required. For further particulars, call on or address,

E. NICHOLSON, Room 9,
152 Superior St., Cleveland, Ohio.

TO RENT.

A Chicago Forge Works and Blacksmith Shop with an established trade, two Steam Hammers, Bolt Cutters, Drills, Grindstone, Anvils and Blacksmiths' Tools, or would take a partner.

Address "FORGE"
Office of *The Iron* 38 Clark St., Chicago, Ill.

WANTED.

A thorough Chemist for a Steel Works. Only those having had extensive experience need apply. State salary expected.

Address "EXTENSIVE,"
Office of *The Iron Age*, 83 Reade St., New York.

Foundry to Let.

Would lease our Iron Foundry for a term of years; fully equipped for 20 moulders, with 13 Moulding Machines for light work; Flasks, &c; also Tumbling Barrels, Polishing-Room and Japan Kiln, with separate Engine and Boiler of 30 horse-power; Buildings of brick; all nearly new and ready to run in an hour's notice. Would also rent a part of our Brass Foundry and one story of main Factory if desired.

TAYLOR MFG. CO., New Britain, Conn.

Engine Wanted.

16 x 42 Automatic Engine, Tubular Boilers, Shafting, Hangers and Wood-Working Machinery.

"W. W. & CO.,"
Office of *The Iron Age*, 38 Clark St., Chicago.

THE Columbus Hollow-Ware Company, of Columbus, Ohio, offers for sale its entire property, viz: Two (2) acres of Land, Buildings, Machinery, Patterns (Brass and Iron), Flasks, and Stock of Hollow-Ware. The Buildings are all of brick, with slate roofing, and are well arranged for general manufacturing purposes. The Foundry is 100 ft. x 60 ft., well lighted and ventilated. The Engine—seventy (70) horse-power—and Boiler are *first class*. This property is situated on a river, thus securing a constant supply of excellent water independent of well or city water. A switch track in the factory yard gives direct connection with the thirteen (13) railroads centering in Columbus. Price and terms very reasonable.

Address COLUMBUS HOLLOW-WARE CO.,
Columbus, O.

A Mill Manager of experience in making Bar Iron, Nail Plates, Cut Nails; also posted in Machinery and Foundations as well as managing men. Best of reference. Address

"MANAGER,"
Office of *The Iron Age*, 83 Reade St., New York.

A practical Iron and Steel manufacturer, who is thoroughly acquainted with the latest European methods and has held various positions in large Iron and Steel Works, desires an engagement. Has made a specialty of Soft Steel Bars, Plates, Forgings and Castings. Address "S. S."
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

SCRAP IRON.

We buy all kinds of Iron and Steel Scrap, Burnt Iron, Old Rails, &c., &c. Write us, naming quantity, price, &c.

ROBINSON & ORR,
115 Water St., Pittsburgh, Pa.
(ESTABLISHED 1850.)

International Exhibition.

LIVERPOOL, 1886.

The importance of this Exhibition makes it worthy the attention of American manufacturers.

Applications for space will close by Nov. 1st, 1885, and all spaces will be allotted by Dec. 1st.

William Glassey & Co., 54 Victoria street, Liverpool, will be pleased to represent American manufacturers and make advantageous arrangements for space and the effective exhibition of their goods, and they refer to their long experience in selling American manufactures in England as specially qualifying them to do this satisfactorily. Address

WILLIAM GLASSEY & CO.,
54 Victoria st., Liverpool, England, or
97 Chambers st., New York.

SECOND-HAND MACHINERY

In Good Order. For Sale Cheap.

1 Engine Lathe, 42 in. x 10 ft. bet. centers.
1 " 48 in x 20 ft bed.
1 " 36 in x 18 ft. "
1 " 30 in x 16 ft. "
1 " 28 in x 20 ft. " Pond.
1 " 20 in. x 10 ft. " "
1 " 24 in. x 12 ft. " Fifield.
1 " 20 in. x 8 and 10 ft. bed. Putnam.
1 " 19 in x 10 ft. bed. Lodge & Barker.
1 " 18 in. x 9 ft. " Wright.
1 " 15 in. x 6 ft. Porter. Rod feed only.
1 " 15 in. x 6 ft Flather. Rod feed only.
1 " 15 in. x 6 ft Flather, with turret.
2 Hand Lathes, 13 in x 4 and 5 ft. Garvin.
1 Planer, 50 in. x 50 in. x 17 ft.
1 " 36 in. x 36 in. x 7 ft.
1 " 32 in. x 32 in. x 9 ft.
1 " 20 in. x 20 in. x 4 ft.
1 " 24 in. x 24 in. x 5 ft.
1 " 17 in. x 17 in. x 3 ft.
1 Shaper each 20 in. and 24 in. stroke.
1 26-in Back-Geared Drill.
1 20-in Plain Drill.
1 Lincoln Pat. No. 2 Miller.
1 each 3, 4 and 6 Spindle, No 0 Drills. P. & W. Co.
1 No. 1 Screw Machine. Wire feed. Pratt & Whitney.
1 16-in. Stroke Crank Planer.
1 10 H.-P. Otto Gas Engine.
1 10-H.-P. Vertical Engine and Boiler.
1 6-H.-P. Vertical Engine. Loco. Boiler.
1 6-H.-P. Vertical Engine and 10 H.-P. Loco. Boiler.
1 375-lb. Drop Hammer. Beecher & Peck.
1 40-lb. Trip Hammer.
2 10-H.-P. Hoisting Engines.
1 Merriman Bolt Cutter, taking sizes to 1⅛ in.
2 Horizontal Boilers, 14 ft x 42 in.

Also full line of New Machinery.

New York Agency TAYLOR MFG. CO., Engines, Boilers, &c. Correspondence solicited.

PRENTISS TOOL AND SUPPLY CO.,
P. O. Box 3362. No. 42 Dey St., New York City.

TO MANUFACTURERS.

Are You Looking for PATENTED SPECIALTIES To Manufacture?

If so write us, giving full particulars of your wants, and we can undoubtedly save you *time and money*. We have a large number of Patents (both for the United States and Canada) registered in our office. Manufacturers can make favorable arrangements with us to secure, on a basis of royalty or by purchase, any Patent we have. Address

F. H. LEAVENWORTH,

Manager Selling Department,
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One 32 x 54 Horizontal Corliss Engine,
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Address LOGAN & STROBRIDGE,
New Brighton, Pa.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]
LONDON, WEDNESDAY, October 7, 1885.

Scotch Pig.—The market is unchanged. We quote makers' brands as follows:

Coltness, alongside, Glasgow		49/6
Langloan, "	"	48/
Gartsherrie, "	"	46/
Summerlee, "	"	48/
Carnbroe, "	"	45/6
Glengarnock, "	Ardrossan	46/
Eglinton, "	"	42/6
Dalmellington, "	"	44/
Shotts, "	at Leith	47/

Lighterage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig—Market is unchanged. We continue quotations, f.o.b. shipping ports:

Middlesboro,	No. 1 Foundry	37/
"	No. 2 "	36/
"	No. 3 "	33/ @ 33/6
"	No. 4 Forge	32/

Bessemer Pig—The market is a little steadier. W. C. Hematites are quoted 43/6 for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is unchanged. We quote at works:

		£	s.	d.		£	s.	d.
Staff.	Ord. Marked Bars	7	10	0	@	.....		
"	Medium "	6	0	0	@	6	10	0
"	Common "	5	10	0	@	5	15	0
Hoops, 20 W. G. and over.								
"	Common Best	6	15	0	@	.....		
"	Medium	6	5	0	@	6	10	0
"	Common	6	0	0	@	6	7	6
Sheets, 20 W. G. and under,								
"	Ordinary Best	7	15	0	@	8	5	0
"	Common	7	5	0	@	7	15	0

Steel Rails—Are unchanged. We quote £4. 15/ @ £4. 17/6, f.o.b. shipping ports.

Old Rails.—Market is unchanged. We quote Old D. H's, c.i.f. New York, £3 @ £3. 2/6.

Scrap.—There is no change to report. We quote Heavy Wrought £2. 10/ @ £2. 15/, c.i.f. New York.

Copper.—The market is weaker. We quote Best Selected, £45. 10/ @ £46. 10/, and Chili Bars, £40. 10/ @ £41.

Tin.—The market is unchanged. Straits Tin, spot, is quoted £91. 15/ @ £92. 5/, and futures £90. 15/ @ £91. 5/.

Tin Plates—Are a little steadier. We quote:

Tin Plates, 10x14,	1st qual.	Charcoal	19/6 @ 21/6	
"	"	2d "	"	18/6 @ 19/
"	"	1st "	Coke	17/6 @ 18/
"	"	2d "	"	14/ @ 14/6

Spelter—The market is a little lower. We quote Ordinary at shipping ports, £14. 5/.

Lead—Market firmer. We quote Common English Pig, £11. 12/6.

Freights.—Steam from Glasgow to New York, 1/ @ 2/.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, October 7, 1885.

Wall street failures, the European war-cloud and the conference of railroad officials, each and all of these events together, have been sources of disturbance, particularly in the speculative markets, but a survey of the situation brings to view no radical change, either in trade or finance, during the past week. If there has been no improvement the markets, as a rule, hold their ground. Wheat is inclined to droop in the absence of an export demand. The extreme fluctuations in wheat reached about 2¢ @ 3¢, November ranging between 96⅝ and 99¢—leading off about midway. Visible supply of wheat, as reported by the New York Produce Exchange, is 43,632,813 bushels—an increase of 585,520 bushels since the previous week. Compared with the same date last year, the visible supplies, October 1, show an increase of 20,000,000 bushels of wheat and a decrease of 1,700,000 bushels of corn. In the dry-goods jobbing trade business is of somewhat reduced, though very fair, proportions. It is noticed as a satisfactory feature of the season that prices with jobbers have ruled more uniform than in many years, and with more substantial results than any had dared to anticipate.

The Stock Exchange markets have been stronger, and, despite the sharp break on Friday, caused by the failure of Wm. Heath & Co. and Henry Smith, prices have advanced. The week opened with expectations of favorable action by the railroad presidents, which served to stimulate speculation. On Saturday, in consequence of the developments of the previous day, there was a general calling in of borrowed stocks, giving bull operators the control. The same influences carried the market upward again on Monday, the Lackawanna and Northwestern leading, with much excitement. On Tuesday the market was less active, but generally strong, with irregularity on account of realizing sales. To-day there was increasing strength and active trading. St. Paul advanced to 78¼; Oregon Navigation to 84½; Oregon Transcontinental to 23. Lackawanna is quoted 108⅜.

United States bonds close as follows:

	Bid.	Asked.
U. S. 3 per cents	103¾	—
U. S. 4½s, 1891, coupon	112½	112⅝
U. S. 4s, 1907, coupon	122⅜	122⅞
U. S. Currency 6s, 1895	128½	—
U. S. Currency 6s, 1896	130½	—
U. S. Currency 6s, 1897	132¾	—
U. S. Currency 6s, 1898	134¾	—
U. S. Currency 6s, 1899	136¾	—

Wall street was startled on Friday by the failure of Wm. Heath & Co., one of the best known firms on the Stock Exchange, and of late prominent operators on the bear side. The failure is due to the inability of Henry M. Smith, one of their principal customers, to protect his contracts when called upon for margins. The previous failure of Soutter & Co. is believed to have been caused in like manner. The house is understood to have been short upward of 100,000 shares, and the firm's indebtedness to their customers is said to have been $1,500,000 or $2,000,000. Smith's liabilities are estimated at $2,000,000, of which $1,250,000 are with Heath & Co. The former at once made an assignment, without preferences, to A. R. McCarless, the cashier of the firm, and Smith made an assignment to John T. Cuming, attorney. G. P. Morosini claims to have on deposit with Heath & Co. $265,000 in cash, besides stocks which cost $215,000.

The trunk-line settlement at the meeting of railroad presidents is accepted as an effort in good faith to restore the transportation business to a normal condition, but negotiations are not yet complete. After Tuesday's meeting Commissioner Fink said he believed that the old differences would be removed. Shippers of east-bound freight have taken advantage of the low rates prevailing up to October 1 by making all the contracts they could before the advance in rates went into effect, and consequently east-bound shipments were unusually heavy. Under the rule the trunk lines will not re-receive after October 15 any business from their Western connections contracted for at the cut rates.

The ripple in West street caused by recent failures has already subsided, and without disclosing anything wrong in the condition of general trade. So far from this, considerable inquiry among dealers in leading staples affords conclusive evidence as to the sound condition of the general markets. Pig iron and steel are in good shape. The wool market has been remarkably active, and for a month past sales have been larger perhaps than ever before. The leather market is active at higher quotations. Coffee is dull, values nominal. Cotton is quiet; new crop quoted ⅛¢ under current sales. Provisions dull and in buyers' favor. Tobacco quiet and steady. Raw sugar dull and nominal. In freights grain rates are easier, with more call for cotton.

The volume of business as indicated by the returns from leading clearing-houses throughout the United States appears to be undiminished. The comparison with the previous week, as well as with the corresponding week of last year, is very favorable. In the aggregate there is an increase of 3 %; outside of New York the increase is 2½ %. Eighteen cities report increased clearings as compared with last year. Pittsburgh lost 23½; Baltimore, 9; Chicago, 2, and Syracuse, 24½. As will be observed, the most encouraging statements come from the West and Southwest and South Atlantic States. The reports of business failures occurring throughout the United States show a slight increase, the Western and Pacific States furnishing one-half the total. The posted rates for bankers' sterling were reduced to $4.84 for 60 days, and $4.86½ for sight. The market is steady. The weekly bank statement shows a continued decline in surplus reserve amounting to $3,432,700, and leaving that item $41,499,200 above legal requirements, against $29,897,675 at this time last year. In loans there was an expansion of $1,670,200. The banks lost chiefly by an outward movement of currency and partly through Sub-Treasury operations. The money market is without noticeable change.

The imports of foreign merchandise at this port during the last week were $274,735 below those of the previous week, the total valuation being $6,356,990, against $8,233,312 for the corresponding week last year. Since January 1 the total is $293,767,875, as compared with $334,637,351 for the same time in 1884. Exports from this port for the week were $995,638 above those of the previous week, the total valuation being $6,605,891, making the aggregate since January 1 $253,030,761, as compared with $247,888,339 for the corresponding period last year. Included in the items are 13,894 barrels apples, 123,177 bushels wheat, 441,335 bushels corn, 12,213 bales cotton, 8,266,372 gallons petroleum, 3,943,628 lb cut meats, 6,073,130 lb lard, 4526 hogsheads tobacco.

According to the Custom-House reports the imports of specie and bullion at this port during last week amounted to $1,570,481, making a total since January 1 of $10,309,512, as against $19,425,321 for the same time in 1884. The exports of specie for the week were $349,246, making a total since January 1 of $19,489,293, compared with $48,715,092 for the same time in 1884.

It is surmised that the reduced dividend of the Lehigh Valley Railroad was ordered in anticipation of expenditure on further extensions of track into the anthracite region.

The decrease in the public debt for September, as shown by the official statement, is $12,757,965, and since July 1 $24,279,807, which is just $300,000 below the figures for the corresponding three months of last year. The September reduction is caused by the liquidation of non interest-bearing liabilities, no change having been made in the bonded debt, which remains the same as on December 1, 1884.

Word comes from Chambersburg that work on the South Pennsylvania Railroad has at last been wholly suspended, and that the contractors are assured that the Pennsylvania Railroad Co. will carry it through to completion.

A telegram from Mexico says the Government will resume payment of subsidy certificates, January 1, on the basis of 7 %.

Public opinion touching the silver question seems to have radically changed. The South has spoken against unlimited silver coinage, and the West is daily becoming more hostile. Our political conventions proclaim against it. The New York Democratic Convention "demands the repeal of the act under which the compulsory coinage of silver goes on," and the Republican Convention of this State calls for the "passage of an act putting an end to the enlargement of the stock of money formed of silver or based on silver." The Massachusetts Republican Convention, still more emphatic, delivered itself as follows: "We demand the immediate and unconditional suspension of the coinage of the over-valued silver dollar" Representative Bland, the author of the silver coinage bill, professes to believe that Congress will take no action on the silver question. If the Warner scheme is offered he intends proposing an amendment that silver bullion shall be coined into dollars of the present standard, to be used in redeeming certificates.

The annual report of the New York Clearing-House Association shows that the total transactions during the year aggregated $26,546,146,691, as compared with $35,616,968,361 during the year ending October 6, 1884. The daily average was $87,000,000.

The West Shore foreclosure sale is fixed for November 24.

Metal Market.

Copper.—Only small sales to manufacturers direct have been made during the week, Lake Superior at 11¢ @ 11¼¢, Electrolytic at 11¢, and other brands at 10⅛¢ @ 10½¢. There is no pressing of any Copper on the market, all holders waiting quietly for a better demand during the winter and a cessation of the panic in Chili Copper in the London market, where Bars dropped this morning to £39. 17/6. They stood on October 1 £40. 10/; October 2, £40. 12/6; October 3, £40. 5/; October 5 and 6, £40. 2/6, and yesterday Best Selected also gave way to £45. 10/. For manufactures in this market dealers ask 16¢ for New Sheathing Copper, 14¢ @ 14½¢ for Braziers, 15¢ for Bolts, and 15¢ for Bottoms. American Yellow Metal Sheathing and Nails, 11½¢; Rod, 15¢, and English, in bond, 13¢. We are cabled from London that the market is weaker.

Tin.—The London market has improved slightly to £91. 17/6 Straits, spot, and £90. 10/, three months, and in sympathy therewith we have been a little firmer at 20⅞¢ @21¢ for Straits, spot, and 20½¢@ 20¢ October-December futures. Mr. Charles Nordhaus, East India agent, 13 Cedar street, New York, favors us with the ensuing September statistics:

	Tons.
September 1, stock	1,800
Arrivals	1,000
Total	2,800
Consumption	1,000
October 1, stock	1,800
Afloat	1,145
October 1, visible supply	2,945
Same time in 1884	2,150

The quotation per cable from Singapore, cost and freight to New York, per steamer, is £91. 10/. Our London cable dispatch states that the market is practically unchanged. *Tin Plates.*—The curtailment in production in Wales of only working one week out of four has been renewed till July, 1886, which has imparted great strength to the market in Liverpool and spread a feeling of confidence in the future here, the more so as stocks on this side are small. Although but a moderate business has been done during the week, there is great stiffness in response to the advance in England. We quote, at the close, large lines, ordinary brands, ₱ box: Charcoal Bright, $5 @ $5.10; do. Ternes, $4.50 @ $4.62½, and Coke Tin, $4.55 @ $4.65; while Liverpool quotes Charcoal, 16/6 @ 18/, and Coke, 14/6 @ 15/. From London we are cabled this afternoon that the market is a little steadier.

Lead.—Absolutely nothing has transpired in the way of sales beyond a retail business, and the market remains about as flat and featureless as can be at nominally 4¼¢, Common Domestic, and $4.30, Refined, while St. Louis quotes $4.12½ @ $4.15. London is steady at £11. 5/, Soft Spanish. Manufactures are quoted as follows: Lead Pipe, 5¾¢ ₱ lb; Sheet Lead, 6¼¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York, 2¢ ₱ lb Shot, Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-lb bags, 1¢ ₱ lb extra. We are cabled from London this afternoon that the market is firmer.

Spelter and Zinc.—The dealings in Common Domestic Spelter have been restricted, and the price has ruled between $4.40 and $4.62½ as to brand, while Silesian has been firmly held at 4⅞¢ @ 5¢. We quote Bertha Refined 7¼¢ @ 8¢, and *Sheet Zinc* 5¼¢ @ 6¢, with a good demand at the advance. From London we are cabled this afternoon that the market is a little lower.

Antimony.—Has been quiet and steady at 8¼¢ for Hallett and 9¼¢ for Cookson. London quotes the former, as heretofore, £35.

Trade Report.

New York Iron Market.

American Pig.—The market is quiet, but firm. The volume of business is fair, with furnacemen displaying little anxiety to force sales, and buyers taking only such Iron as they may need for the near future. We understand that one of the Coplay furnaces is to be blown in at once, and that one of the Lehigh furnaces will follow in a few weeks. Our quarterly report, printed elsewhere, shows that there are only 75 Anthracite furnaces in blast October 1, against 78 a month ago. We quote standard brands of Lehigh and North River Irons, tidewater delivery, nominally as follows: No. 1 X Foundry, $18 @ $18.50; No. 2 X Foundry, $16 @ $16.50; Gray Forge, $15 @ $15.50; the outside figure is asked for special brands. Outside brands sell for 50¢ @ $1 less than our quotations.

Scotch Pig.—The greater firmness of freight rates for October shipment has resulted in a better tone, although quotations have not advanced beyond our figures. We quote nominally as follows for round lots: Coltness, $19.50 @ $19.75 to arrive; Gartsherrie, $19.50 to arrive; Shotts, $19.50 @ $19.75 to arrive; Carnbroe and Glengarnock, $18.50 to arrive; Summerlee, $19 @ $19.25 to arrive; Dalmellington, $18 @ $18.50 to arrive; Eglinton, $17.50 @ $18 to arrive, and Clyde, $18 @ $18.50 to arrive.

Bessemer Pig and Spiegeleisen.—Very little has been done this week in Spiegeleisen, which remains nominally at $25.75 @ $26 for 20 %. Foreign Hematite is quiet. In American Bessemer we note a sale of 2000 tons, and negotiations are pending for 5000 tons more.

Bar Iron.—The market is quiet. The mills are not quite so ready to submit to demands for concessions as they have been in the past, and to that extent the tone is better than it was a month since. We quote for delivery here in round lots: Common Iron, 1.45¢ @ 1.55¢; Medium, 1.55¢ @ 1.65¢, and Refined Iron, 1.75¢ @ 1.9¢, with half extras. Concessions from these figures are very difficult to obtain. Store prices are 1.6¢ @ 1.75¢ for Common, 1.75¢ @ 1.8¢ for Medium, and 1.9¢ @ 2¢ for Refined.

Structural Iron.—Bridge-builders continue to report a steady business, almost exclusively for renewals on old lines of road. The building and allied trades are taking a moderate amount of Iron, chiefly in small lots. Prices throughout remain stationary. Angles may be quoted nominally 1.95¢ @ 2.1¢, delivered, for round lots, and Tees at 2.25¢ @ 2.4¢. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—Some of the mills are not as well supplied with orders as they were a month ago, and the upward tendency of that period has been lost. We quote for round lots: Common or Tank, 2.05¢ @ 2.1¢; Refined, 2¼¢ @ 2⅜¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock; Tank, 2¾¢ on dock; Boiler, 3¢ @ 3¼¢ for Shell, 3½¢ @ 4¢ for Flange, and 4¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2½¢ @ 2¾¢; Open-Hearth Machinery, 2¼¢ @ 2¾¢, and Bessemer Machinery, 2¢ @ 2½¢; English Tool, 13½¢ @ 15½¢; Common grades, 7¢ @ 9¢.

Steel Rails.—The market has been very dull indeed. One sale is reported of 1000 tons at $31.50 at mill, which, however, must be attended with special circumstances, since the usual quotation is $30 at Eastern mills, and some of the Western mills quote $32 on cars at works, for early delivery. For next year's work the railroads are still holding off, though inquiries are frequent and indicate quite large requirements.

Steel Wire Rods.—The week has been a very quiet one. We hear of sales of small lots of Iron Rods which are used for Screws and Butts, and are quoted $42.50 @ $48, according to quality. There are some inquiries in the market for Steel Rods, which we quote $41 @ $41.50.

Old Rails.—We hear of a sale of 400 tons American Tees at High Bridge at $16, and of two lots aggregating 1000 tons at a little over $17. A lot of 2000 tons taken recently at a Gulf port at under $14, f.o.b., is now being offered for delivery in this market by the buyers. We quote $17 @ $17.25.

Old Car-Wheels.—Sellers' and buyers' views are too far apart to permit of business. In one case $16 was asked and only $14 was offered for a 300-ton lot.

Scrap.—The market is very dull. The mills are evidently procuring a large share of their stock at points near them, and enter the market rarely. We continue to quote nominally $18 @ $18.50 for No. 1 from yard.

Rail Fastenings.—We quote for large lots 1.85¢ @ 1.90¢ for Spikes; 2.55¢ @ 2.65¢ for Bolts and Square Nuts; 2.75¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.65¢ @ 1.7¢ for Splice Bars.

Messrs. Andrews Brothers & Co., Haseleton Iron Works, Youngstown, Ohio, manufacturers of Bar, Hoop, Band, Tank and Sheet Iron, and of Bessemer, Foundry and Mill Pig, announce that they have opened an office in Buffalo, in Room 35, Coal and Iron Exchange, which will be in charge of Messrs. W. S. Johnston and W. H. Jones.

Metal Exchange.

The following transactions have been reported as having taken place on the floor of the Metal Exchange:

THURSDAY, October 1.

5 tons Tin, November..... 20.05¢

MONDAY, October 5.

20 tons Tin, October..... 20.40¢

TUESDAY, October 6.

5 tons Tin, December..... 20¢

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, October 6, 1885.

Pig Iron.—There is no special change to notice this week, although the tendency toward higher figures appears to have been checked. The demand is of a less confident character, and, unless there is some change, there appears to be a possibility of things falling back into the old rut. In any case there are well-authenticated reports of sales at less than the usual quoted rates, and not a few instances of bids having been withdrawn at figures not much better than the lowest in the whole year. This, of course, may be only a temporary reaction, but in the meantime the market may be called dull and somewhat inclined toward lower prices. Consumption appears to have increased in spots, but in the majority of cases the change has not been very important. Stocks of Iron on furnace banks have been drawn upon quite liberally, and leading furnaces report sales for most of their product during the next 60 days. Under these conditions there ought not to be any reaction, but the market is so sensitive that buyers take alarm at the least pressure to sell, and reduce their bids or withdraw them entirely. One reason for the weakness may perhaps be found in the fact of bids being solicited for 1000-ton lots and upward by parties who are desirous of starting in their furnaces, providing that advance sales can be made in sufficient quantities at about the current rate of quotations. Still, consumption will be the final arbiter as to prices. If there is to be any further increase in consumption, a few cents per ton in the price of Pig Iron will not interfere with it, neither will a reduction induce purchases on the part of those not needing it. In the meantime inquiries in regard to consumption have not been met with encouraging replies. Some branches are doing better, but the average shows only very moderate improvement, and nearly all are in doubt as to what the immediate future will be. The improvement in Pig Iron, therefore, appears to have kept well abreast of that in other departments, and it is perhaps just as well to pause before forcing prices any higher. Sales during the week have been smaller than for some time past, and as a rule there is a disposition to meet buyers' terms, even though it involves a little shading in price. The asking rates for tidewater deliveries, or its equivalent, are as follows: No. 1 Foundry, $18 @ $18.50; No. 2, $16 @ $16.50; Gray Forge, $15.50. Report says that the inside rates can be shaded, and there is no doubt that such is the fact as regards some brands, but others are firmly held, but not freely taken. Southern Irons are offered at $14.50 for Open Gray, but there is no demand of any importance at the prices asked.

Foreign Iron.—The only sale of importance is one of 6000 tons of Ulverstone for Open-Hearth Steel purposes. Ordinary Bessemer is dull and nominal at about $18.50. Spiegeleisen is dull at about $25.75 asked for 20 %.

Blooms.—There is not much doing, and prices are almost nominal at the following figures asked: Soft Basic Blooms, $33.50 @ $35; Billets, $38 @ $39, and Siemens-Martin, $40 @ $42; extra quality, $43 @ $45; Domestic Blooms, $30.50 @ $32, delivered, for Nail Plate, and $35 @ $36 for Plate and Sheet Blooms; Charcoal Blooms, $50 @ $52; Run-out Anthracite, $43 @ $44; Scrap Blooms, $32 @ $33; Northern Ore Blooms, $32.

Muck Bar.—The demand is fair, and prices are well sustained. Mills pretty well supplied with orders and sales as before, $26.50 @ $27 at mill, according to quality.

Bar Iron.—There is only a moderate amount of business, although inquiries have been quite numerous, and in some cases for large lots. Manufacturers are firm and disposed to ask a trifle more money, to which buyers have not responded in a way to encourage the idea of permanently higher prices, although that, of course, will depend upon the demand. The mills are fairly well employed, but, as already stated, buyers do not like to pay an advance. The usual rates for Best Refined Bars are 1.7¢ @ 1.8¢; Medium and Common qualities, 1.55¢ @ 1.65¢.

Plate and Tank Iron.—The demand has been rather slow of late, but the mills are fairly supplied with orders, so that there is no immediate anxiety for new work. At the same time a feeling of disappointment is expressed that orders should be scarce at the very time when improvement was most confidently expected, and parties are at a loss to determine what the ultimate outcome will be. Prices are easier, but not quotably lower, the asking rates being about as follows: Ordinary Plate, 2¢; Tank, 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¢. A sale of 500 tons of Bridge Plates was closed to-day by Lindsay, Parvin & Co.; price not stated.

Structural Iron.—Business has been very dull during the past 10 days, and, while there are still some orders to be filled, work on hand is being run off without being replaced to the same extent with new contracts. Inquiries are not large at present, and, while a fair amount of business is confidently calculated upon from week to week, it cannot be said that the outlook is very promising. Prices about as last quoted, viz.: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢; Tees, 2.4¢ @ 2.5¢, and Beams and Channels, 3¢.

Sheet Iron.—The demand for Thin Sheets keeps up remarkably, and mills are still crowded with work. Prices are firm, and sales based chiefly on the following figures:

Best Refined, Nos. 26, 27 and 28	3¾¢
Best Refined, Nos. 18 to 25	3½¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	3 ¢
Best Bloom Sheets, Nos. 22 to 25	4¼¢
Best Bloom Sheets, Nos. 16 to 21	4 ¢
Blue Annealed	2.75¢
Best Bloom, Galvanized, discount	60 %
Common, discount	62½%

Wrought-Iron Pipe.—The Pipe market remains unchanged. The continued heavy demand has had the effect of reducing stocks to a very low point, especially for some sizes. Prices remain very firm, and an advance is thought probable in the near future. Discounts as last quoted, viz.: Lap-Welded Black Pipe, 60 % off list price; Butt-Welded do., 42½ %; Butt-Welded Galvanized, 32½ %; Lap-Welded do., 42½ %; Boiler Tubes, 57½ %.

Nails.—Nothing new has occurred in the Nail market worthy of mention; the heavy demand continues and stocks are still very limited. Dealers find it utterly impossible to fill orders, and in some cases are compelled to refuse them on account of scarcity. Prices still continue $2.40, as adopted by the Eastern manufacturers at their recent meeting, less the usual trade discount.

Steel Rails.—There is not much doing, but prices are firm, owing to the mills having all the orders they can comfortably handle. The demand for early deliveries has been pretty well satisfied, however, and orders are not urgent, although small orders are somewhat plentiful at $30 @ $31 at mill.

Old Rails.—Continued scarcity is the most prominent feature in the Old-Rail trade, and, while prices are nominally higher, it is difficult to quote actual sales. Spot lots, Philadelphia, would command $17.75 @ $18, and $19 is bid for deliveries at certain points in the interior. No sales heard of for some days.

Scrap Iron.—The demand is not large, but supplies are so light that prices have an upward tendency, and may be quoted as follows: No. 1 Wrought Scrap, $17.50 @ $18; No. 2 do., $12 @ $13; Horse Shoes, $22 @ $23; Turnings, $13 @ $14; Old Car Wheels, $14 @ $14.50; Old Steel Rails, $16; Fish Plates, $22 @ $23; Cast Scrap, $13 @ $13.50; do. Turnings, $10 @ $10.50.

Goddard & Poulterer have leased the works at Front and Laurel streets, lately occupied by Henry Disston & Sons, and are making all descriptions of Crucible Steel, Tool Steel and Steel Forgings and Steel Castings to order.

Robt. Moffly & Co. (for whom Mr. E. G. James is manager) have leased the premises at northeast corner Ninth and Jefferson streets, Philadelphia, for the purchase of Scrap Iron and Old Metals generally.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue, PITTSBURGH, PA., October 6, 1885.

There has been no important change in the business situation during the week, and the outlook in some respects is not as favorable as it was a few weeks ago. Our manufacturers generally are doing a fair business, but many of them complain that they are making little or no money. Competition is sharp; hence it is difficult to get up prices. Some articles, including Steel Rails and Wrought-Iron Pipe, have been advanced in price, but these are the exception. Nearly all kinds of Finished Iron and Steel have improved but little in price, although, of course, the disposition to cut is not as strong as it was some time ago, when with some manufacturers it was a matter of necessity to sell; financial obligations were pressing, and sales had to be made in order to raise money. There are fewer cases of this character now, we believe, and rumors affecting the character of this and that firm, at one time so common, are not nearly so numerous, and this at least is encouraging. Most of the railroads centering here are doing a very fair freight business, but railroad managers complain that, owing to the very low rates ruling, the earnings are light. Like everything else at present, there appears to be an oversupply of railroads, many of which are not managed either in the interest of the public or the stockholders. About the only matter of importance to note in connection with the labor question is the termination of the Window-Glass workers' strike, which took place on Saturday, the workers substantially accepting the terms offered by the manufacturers. The Monongahela Coal miners, estimated at 6000, and many of whom have families, are still out, and the prospect for an early termination of the nailers' strike is apparently no better. This being Grand-Army day, business will be very light, and to-morrow (Wednesday) the Davis-Island dam demonstration takes place. It is expected that there will be a great many people here from a distance.

Iron Ore.—The Ore trade continues quiet, although there is a more cheerful feeling, owing to the more active condition of the Pig-Iron market. However, as yet the actual situation has not improved much. As but few of the idle furnaces have started up, there has been very little increase in the consumption of Ore hereabouts, and, so far as we can learn, no disposition on the part of furnacemen to anticipate future wants. We may be mistaken, but the indications do not point to much improvement before spring, as there is no inducement at present to start up Pig-Iron furnaces. Late advices from Cleveland continue to report the Lake Ore trade quiet.

Pig Iron.—There has been nothing important developed the past week. Trade continues to keep up pretty well, but prices do not improve. There is not much difficulty in effecting sales at quoted prices, but thus far it has been found impossible to get the latter up. Some Irons that prior to the improved demand were sold below the market have since been sold at an advance of 25¢ @ 50¢ ℔ ton, but these were exceptional cases; hence there has been no general advance. As stated in our last report, nearly all the cheap lots have been picked up, and, as a consequence, the market is firmer, and furnacemen, as a rule, are indifferent about selling, although consumers have no trouble in obtaining all they want for present use at current rates; but it is doubtful whether furnacemen would contract for future delivery except at an advance. Consumption in this district continues considerably in excess of production, and stocks are steadily being reduced, although still ample to supply present wants. Some operators still express the belief that better prices will obtain in the near future, but they are not very numerous. We quote prices as follows:

No. 1 Neutral Mill	$14.75 @	$15.00,	4 mos.
No. 2 Neutral Mill	14.25 @	14.50,	4 "
All-Ore Mill	15.50 @	16.00,	4 "
White and Mottled	13.50 @	14.00,	4 "
No. 1 Foundry	17.00 @	17.50,	4 "
No. 2 Foundry	15.00 @	16.00,	4 "
Charcoal Foundry	19.00 @	21.00,	4 "
Cold-Blast Charcoal	26.00 @	27.00,	4 "
Bessemer Iron	17.00 @	17.50,	4 "

Included in the sales reported the past week were some 3000 tons Bessemer Iron at $17, cash, to $17.50, four months.

Muck Bar.—There is more doing, but prices are no better. We continue to quote at $26 @ $27, cash; sale of 1000 tons reported at $26.50.

Manufactured Iron.—While possibly orders are not coming forward quite as freely as they did a few weeks ago, the mills all appear to be pretty well employed, and if prices were fairly remunerative there would be no particular cause for complaint. Manufacturers claim that there is little or no profit in ordinary Merchant Iron, and some of the specialties are also being cut pretty close. A number of the mills have about all they can do on Skelp Iron. We continue to quote prices on a basis of 1.60¢ @ 1.70¢ for Merchant Bars, 60 days, 2 % off for cash.

Nails.—The situation here remains unchanged. The strike which was inaugurated over four months ago still continues, and there is apparently but little prospect of its being brought to an early termination. A number of factories at Wheeling and other points along the Ohio River are working non-union, but here in Pittsburgh there has not been a single machine in operation for over four months.

Wrought Iron Pipe.—The Pipe mills continue very busy; but few of them are able to fill orders promptly for immediate delivery, and it looks now as if they would have about all they can do this month and next—possibly until the close of the year. Prices firm, but unchanged. Discounts on Black Butt-Welded Pipe in car lots and upward, 45 %; less than a car lot, 42½ %; do. Galvanized, 35 %; less, 32½ %; Black Lap-Welded in car lots, 62½ %; less, 60 %; do. Galvanized, 45 % in car lots, and 42½ % for less. Discount on Boiler Tubes, 57½ %; 2-inch Oil-Well Tubing, 13¢ ℔ foot, net; 5⅜ inch Casing, 40¢; 8-inch Drive Pipe, $1.30

Merchant Steel.—Demand continues fair, but there is continued complaint in regard to prices, which for most articles are being shaved very close. Best brands Refined Cast Steel, 8½¢; do. Crucible Machinery, 4½¢ @ 4¾¢; Open-Hearth and Bessemer do., 2¼¢ @ 2½¢. Nail Slabs, for which there is not so much inquiry, owing to the strike, are quoted at $28.50 @ $29 ℔ ton.

Steel Rails.—There is continued inquiry, mainly for small lots for near-by delivery, and prices continue firm; the last sale reported was at $31, cash, at mill, which is an advance of from $4 to $5 ℔ ton, as compared with the lowest point some months ago. Both the Pittsburgh Bessemer and Edgar Thomson works are well provided with orders.

Old Rails.—Old Iron Rails are not offering very freely, but there does not appear to be as much inquiry as there was a few weeks ago, and the tone of the market appears to be weaker; while the last sale reported was at $19.25, one of the largest consumers reports having had offers to sell at $19. Old Steel Rails may be quoted at $17 @ $18, according to lengths. The latter are to a considerable extent taking the place of Crop Ends.

Railway Track Supplies.—There is a fair trade; no change in prices. Spikes, 1.90¢, 30 days, delivered; Splice Bars, 1.60¢ @ 1.70¢; Track Bolts, 2.75¢ with Square and 2.85¢ with Hexagon Nuts.

Crop Ends.—In the absence of sales we continue to quote New Steel Rail Ends at $18.25 @ $18.50, and Steel Bloom Ends at $17.50 @ $17.75 ℔ ton. As noted elsewhere, Old Steel Rails cut to lengths have to a considerable extent taken the place of Crop Ends.

Scrap.—There is a fair business, but no improvement in prices, which dealers claim are low here, cost at most sources of supply considered. No. 1 Wrought Scrap, $16 @ $17 ℔ net ton; Wrought Turnings, $12.50 @ $13 50; Old Car Axles, $22 @ $23; Cast Borings, $10.50 @ $11 50, gross; Old Car-Wheels, $14.50, gross; Crucible Scrap Steel, $20 @ $21, net ton; Open-Hearth do., $16 @ $16.50, gross.

Window Glass.—At a meeting between the conference committees on Saturday the wage scale was settled, the workers agreeing to accept substantially the terms of the manufacturers. No change in price. Discounts on Single-Strength, in car lots and upward, 70 and 10 %; Double-Strength, 75 and 5 %.

Coke.—This interest has been devoid of new features for some time past. Trade only foir; prices unchanged. Blast-Furnace Coke, $1.20 ℔ ton, free on cars at ovens.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St., Cor. Lake St., CHICAGO, October 5, 1885.

Hardware.—The closing week in the month has been rather disappointing to jobbers here. The dullness experienced during the week previous was attributed to the warm weather, and a portion of the falling off in demand last week to the closing of the month, which is always less active; but, after making due allowance for these causes, trade was very much more quiet than can be satisfactorily accounted for. Notwithstanding this condition of the market, prices have ruled firm, and manufacturers continue to ask higher prices and change price lists to correspond with the general tone of all lines of business. Jobbers are in no way disturbed by the letting up in trade, believing it to be only a temporary lull which will be followed by another active month. Builders' Hardware is the only line in which the demand has been sustained. Cutlery has slightly improved over what it was several weeks ago. Wagon Material and Heavy Hardware do not increase in demand, as was expected. Carriage Bolts are less called for since the advance in price to 75 % off to the general trade and 80 % off to the larger dealer.

Barb Wire.—There appears to be no material change in the market. Heavy buyers having contracted for pretty nearly all they shall want, trade consists almost exclusively of those who buy a few tons at a time. Quite a number of inquiries were made during the week about prices on Wire to be delivered next spring, but very little satisfaction could be given, as mills decline to quote prices so far ahead. Jobbers have not changed their prices on Painted Wire, which is quoted at $3.50, and Galvanized at $4.50. Manufacturers' prices in large lots for immediate delivery are from ⅛¢ to ¼¢ less, but they claim that they are not seeking orders and have all they can attend to for the present.

Nails.—The Nail market stands just about in the same position that it was a week ago. Jobbers are quoting $2.50 @ $2.60 for Iron Nails and $2.65 @ $2.75 for Steel Nails in small lots. The higher price is only demanded where an order is made up almost entirely of sizes which are short or where the order calls for nothing except Nails. Consumers are almost indifferent as to the price, because they are frequently compelled to obtain Nails at almost any figure. If the area of territory did not increase as the stock of Nails diminished, it might be said that the demand was somewhat lighter during the last week than it has been for 30 days. Jobbers, however, are now receiving orders for Nails from sections of the country which are entirely out of their district, and the shorter the supply becomes the greater the distance whence they come. Orders for Nails sometimes include orders for Hardware, with the hope of obtaining that which they most need. They find themselves, however, better able to supply this demand, because it has been gradually changing into smaller sizes, so that Lathe, Finishing and Case Nails are now the heavier portions of the orders. Stocks are pretty full in these numbers and can be had at a trifle less from mill. Then, too, the mills that are running have been devoting most of their time to cutting the smaller sizes, on which the new feeders are said to be the most successful.

American Pig Iron.—The demand during the week has been largely in carload lots. These have been quite numerous, which keeps the aggregate tonnage up to a fair average compared with the last 60 days. Dealers, speaking of the market, say that many of the cross-road buyers who have not taken anything but carload lots for years are one after another placing orders for 50 to 200 tons, to be delivered as they may need it, some of them paying as much as $1 a ton advance on the price they paid 60 days ago. Furnacemen and sellers vary considerable in

their opinions regarding the advance in prices. Some of the dealers are firm in their views that better figures could be obtained by the mere asking if furnacemen were united upon the subject. There is another class who are talking of better figures, but when an opportunity to sell Iron presents itself they do not appear capable of raising themselves above the figures at which they have sold during the past three months. With these two factors standing face to face it is difficult to give the exact status of the market. The only point upon which we can be certain is that prices are firm at quotations, and that some of the furnaces are withdrawing former prices and are asking higher figures. Several of the Charcoal furnaces who advanced their price to $19, cash, three or four weeks ago have not sold a pound of Iron at those figures. This Iron continues to accumulate in their yards, and as the pile grows larger from day to day consumers look upon the higher price asked with considerable suspicion, and remark: "When furnaces attempt to realize upon this accumulated stock it will be a test of the strength which is now imputed to the trade." In further verifying the position of the market dealers show duplicates of orders that were placed the first of September which furnaces refuse to accept at less than 50¢ @ $1 ℔ ton advance on prices for Charcoal Iron, and options that were given acceptable in 30 days have in several cases been withdrawn without notice. In view of the difference of opinions and the want of sales at higher prices we continue our quotations on Lake Superior Charcoal Iron at $19 @ $19.50, four months, in quantities ranging from 50 to 100 tons. On carload lots dealers accept this price from some, and from others ask 50¢ advance, according to circumstances. We quote Lake Superior Coke at $18 @ $18.50, and Cinder Mixed at $17. The price on Ohio Irons is considerably more firm than at any time previous, the ruling quotation on Standard Blackband being $18.50. According to several telegrams under date of October 3 from furnaces, the price at which some of the leading brands of this Iron could be bought would be $19 in this market, being an advance of 50¢ ℔ ton. But so long as there are other furnaces which make an Iron that is the equivalent it is hardly possible for this furnace to obtain the advance. With the exception that Southern Irons are scarce there is no change in our quotations, which are $17.50 for No. 1; $16.50 for No. 2; $15.75 for No. 2½; $14.75 for No. 3, and $13.50 for Mill Iron. Dealers remark that one of the strongest indications of an improvement in the Pig-Iron market is the fact that for the first time in four years there appears to be a scarcity of cars for transportation. Railroads are no longer offering to make concessions in freight, but are asking higher rates and claim that they have no difficulty in keeping this class of their rolling stock fully employed at better figures than they obtained several months ago.

Structural Iron.—In the way of new business nothing of importance has occurred during the past week. Makers and jobbers are quite active in supplying material under contract, and it is said that builders are having considerable trouble in obtaining their Iron as rapidly as they require it. There seems to be some difference in prices on Shapes, which is governed largely by the location of the mill. We quote Bridge Plates, $2.10 @ $2.20; Angles, guaranteed 50,000 ℔ ultimate strength, $2.10 @ $2.25; Tees, $2.50 @ $2.75; Beams and Channels, $3 10. On some of these shapes there is an advance of from $\frac{1}{10}$¢ to $\frac{3}{10}$¢ from store.

Merchant Steel.—Trade during the past week in Merchant Steel has been very light. Buyers are taking only in small lots, and nothing of great importance seems to be in sight. The irregularity in demand and the numerous qualities in the market keep prices weak and unsatisfactory. We renew the following quotations on Open-Hearth and Bessemer Steel at 2¾¢ @ 3¢; Crucible, 4½¢ @ 5¢; Plow Steel, 5½¢ @ 6¢; Tool Steels are quoted at prices ranging from 7½¢ to 9¢ for ordinary qualities; special grades and extras range from 9¢ to 13½¢.

Plate and Tank Irons.—There has been quite an active demand for this class of Iron during the week. Local trade has been much improved and a number of good orders have been received from distant consumers. We quote Tank Iron at 2.25¢ @ 2.40¢; Shell, 3¢ @ 3¼¢; Flange, 3¾¢ @ 4¢; Fire-Box 4½¢ @ 5¼¢; Universal Mill Plate, 2.20¢. Boiler Tubes are quoted at 57½ % off.

Steel Rails.—The demand is fairly active in lots ranging from 100 to 1000 tons. Mills are quoting from $32 to $35 ℔ ton for immediate delivery, according to weight. Quite a number of contracts have been made within the range of these figures for delivery during the early part of next year. The demand for immediate delivery seems less active in this market than is reported from some other localities. The upper branch of the North Chicago Rolling Mill Co. is still idle, because the demand is not sufficiently urgent to put it in operation.

Bar Iron.—There has been only a fair week's business in the Merchant Bar trade. Some of the dealers have had less trade and others have had more, but, summing up the aggregate, a slight falling off would be perceptible when compared with several weeks previous. Consumers are slow to accept the statement that prices have advanced, and invariably defer placing orders when they are asked to pay even one-tenth more than the price of the last lot. In small lots to city trade Best Refined brands are quoted at 1.80¢ rates, and to country trade in car lots at 1.70¢ rates. Common Old Rail Bars are quoted at 1.70¢ rates in small lots, and 1.55¢ @ 1.60¢ from mill.

Old Rails.—There is quite an active demand in this market at present. Several lots of 1000 tons each have changed hands during the week at $17.50 @ $18, Chicago delivery. Holders are asking $18.50 @ $20, but buyers are unwilling to concede this difference, and a fair market value is supposed to be about the figure at which the sales were made. The N. C. R. Co. are offering $17.25, Milwaukee delivery, and have secured quite a number of small lots at that figure recently. The firmness at which Old Rails are selling has brought into the market quite a number of unexpected buyers, who claim that they must buy Rails at former figures or obtain higher prices for their Bar Iron and other shapes.

Black Sheets.—The demand during the week was somewhat better from store, and makers are reported to be very much behind in their deliveries for October. Jobbers continue to quote No. 24 at $3.10; Nos. 25 and 26, $3.20, and No. 27 at $3.30. For delivery during November and December mills are asking the same prices, but in all probability will accept orders for a shade less

Galvanized Iron.—Business is much the same, except that orders are not so pressing as they were a short time ago. Stocks are in much better shape, and some of the dealers report a larger trade for September than they have had for several years. They claim that this trade would still have been larger if sufficient stock could have been obtained in the early part of the month. Jobbers' quotations from store continue to be 60 % off on Juniata, and 60 and 10 % off on Charcoal.

Old Wheels.—The market is reported quite firm, with quotations for Whole Wheels at $14 bid and $14 50 asked. Broken Wheels are quoted at 50¢ above this price. Quite a small proportion of the Wheels that are in this market could be had at this price, as the holders are not pressed to sell and are waiting for better figures.

Scrap Iron.—The demand was quite active during the week at $14 for No. 1 Mill and $9 for No. 2. Selected Forge is held tolerably firm at $17, while mills are offering a shade under these figures. Dealers are not anxious to sell at the price offered on Mill Scrap, and are asking 50¢ @ $1 ℔ ton above prices quoted.

Pig Lead.—Trading in Pig Lead during the week has been very light. Consumers are all pretty well supplied for October, and prices have consequently dropped to $4.12½ @ $4.15 for spot Lead. Speculators are asking slightly higher figures for November delivery, but the dullness of the market does not encourage consumers to invest in stock that is liable to be worth less money before the time of delivery arrives.

Messrs. Everett & Post, Chicago and St. Louis, state that they have opened, in conjunction with their Pig-Lead business, a Tin-Plate and Metal brokerage department, and have as their representatives in New York Messrs. Hammond & Lobdell.

Messrs. J. F. Forsyth and E. A. Hyde have entered into a copartnership in the Pig-Iron commission business, under the firm name of Forsyth, Hyde & Co., with their office at 53 Dearborn street, Chicago. They state in their announcement that they make a specialty of Lake Superior Charcoal Iron for Foundry, Car-Wheel and Malleable purposes; also Soft Foundry and Southern Irons.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., Chattanooga, October 5, 1885.

Reports from the southeastern portions of the Southern States are very unfavorable. The continued heavy rains have damaged the prospects for a large yield of cotton, which has, of course, had a corresponding effect on almost all lines of business. In many places the railroad lines have been washed out, and transportation and travel have been very much obstructed. The present uncertainty of the cotton crop has thrown a damper on the bright anticipations that prevailed among the commercial fraternity a few days ago, but the fine sunny weather which has come upon us again will soon bring about a more cheerful feeling, and, excepting in a few localities where overflows have taken place, business will resume its usual tone, although the large yield will no doubt be somewhat curtailed. The telegraph wires, indorsed by printer's ink, are again materializing another large furnace to be erected near Talladega, Ala. It seems that a large English plant is to be removed and put down at this place, and all the late improvements added to it. From all that can be learned the chances are that the enterprise will be carried out.

Pig Iron.—The continued rains have had an effect of reducing the quantities of high grades of Foundry Irons, which now are hard to get. Wet Coke and wet Ores are not very conducive to running a furnace, and the result has been that many of the furnaces have involuntarily turned on to Forge Irons. The question of Coke is occupying the minds of furnacemen more every day. The many analyses of the chemist have not "panned out" in all cases, and owners have come to the conclusion that figures sometimes lie, but results never. In regard to prices there is little change to note. As an index of the same we note a sale of 600 tons of No. 3 or Open Mill at $11.85, net, at the furnace, and an offer for 2000 tons, 2½, at Chicago, at $16.25, four months, but declined. This offer, however, was made for January, February, March and April delivery. Prices may be said to be steady at the slight advance which occurred a short time since. Furnaces are contracting for round lots for delivery during the balance of the year, while very few are extending their sales into the next.

Miscellaneous.—The lumber business is very active, and prices have advanced all along the line. The railroads are offering facilities and rates which have stimulated the long-leaf pine business very much, and large shipments are being now made to Northern ports. Shipments of poplar and hardwoods continue unabated to Eastern ports, and some of the mills are under contracts for the next nine months. The local mills here are running full on Bar Iron and Railroad Fastenings, for the latter of which there is a much-increased demand sprung up within the last two weeks. The Pipe foundries still report the demand for Water and Gas Pipe very great at the advance in price, and no difficulty in keeping orders booked for weeks ahead. The Sash, Door and Blind factories are now running night turn to keep up with the demand, and they report no abatement of orders.

Birmingham.

Birmingham, Ala., October 5, 1885.

Almost continuous rains last week have perceptibly depressed the spirits of the cotton interests of this belt, and, aided by other influences of one kind and another—possibly none of them of enduring potency—seem to have in a degree arrested the improvement in business, and at this time of the year it is, of course, almost equivalent to retrogression. Merchants are buying rather more cautiously than they were when the crop prospects were better, and the delay to the movement of cotton is, of course, affecting all of their purchasing plans. As a rule, though, there is no apparent weakening of the measurably revived confidence that of late has been so beneficent a feature of the business situation, and there is as yet no cessation of accounts from the East to the effect that this, along with other parts of the South, has bought more goods this season than ever before.

Pig Iron.—The furnacemen hereabouts seem generally to have settled down to the conviction, which appears to govern at the North, that beyond the slight advance of, say, the last three weeks, no materially better prices are to be had for some time yet. Now and then one even hears the idea advanced that possibly there has already been too much of an effort to bull the market. The demand, however, is still satisfactory.

Rolled Iron—Is selling well enough in every direction, but hardly at satisfactory stationary prices.

Cast Pipe.—A good volume of orders continues to come here for Cast Pipe, and prices are firm at the slight advance chronicled in this correspondence two weeks ago.

Nails—Are in more urgent demand than ever, and at a slight advance, the card rate f.o.b. at Brierfield and Helena being now $2.35. As for Steel Nails, the dealers here say they are not to be found reliably, in unbroken sizes, anywhere.

Miscellaneous.—The foundries and machine shops here as a rule still have on hand about all they can do seasonably, though some of the smaller concerns whose business is peculiarly subject to ups and downs report work scarcely so plentiful as it was some three weeks ago.

Lumber.—Nothing hereabouts has mended more materially of late than has the Lumber business. Every product of Yellow Pine brings considerably better prices now than it brought even two weeks ago. The results of the advance, however, are hardly definite enough as yet for very safe quotations on sales to distant markets. The evidences of prosperity about some of the larger mills in the State are very conspicuous, which statement is especially true with reference to the adoption of late improvements in mill machinery.

St. Louis.

St. Louis, October 5, 1885.

Notwithstanding the depressing influence of five rainy days during the week, jobbers had an active trade, although shipping was retarded. In a mercantile sense this is the holiday season of the year, and in public interest the fair week, from the 5th to the 10th, will rival the closing week of the year, Thursday being proclaimed a holiday with each annual recurrence. The event of the week in manufacturing circles was the successful competition of the Granite Iron Rolling Mills (St. Louis Stamping Co.) for an order of 1000 tons of Plate Iron, placed by the Wrought-Iron Range Co. There now seems to be some probability that the scheme to harmonize the interests of bondholders and share-owners of the St. Louis Ore and Steel Co. will result in an arrangement by which the affairs of that much-litigated concern will be put in a satisfactory shape. Shipments eastward are very heavy, owing to the corn crop and intended advance of rates on the 15th inst.

Hardware.—At present business in this line is one of the most active with jobbers, being of large volume, and prices with such a quiet tendency to advance that sales are readily made. Salesmen find that reference to withdrawal of quotations by manufacturers has a decidedly stimulating effect on country customers and relieves them from the necessity of using so much of the "honey of persuasion," as they found necessary only a few months since to secure orders. On the 28th ult. the St. Louis Shovel Co. withdrew all quotations.

Merchant Iron.—No change has yet been announced by the stores from former prices, $1.80 @ $1.85, but there are fewer concessions for large orders than have been made during the two previous months, owing probably to an advance of freight rates and the higher prices of several mills becoming general. Some improvement in the demand is noted on Bar Iron, and Sheet continues active.

Nails—Continue to be the source of most uneasiness to merchants. As might be expected, prices are higher and vary considerably, according to order and customer. To obtain shipment of sizes and quantity common to seasonable orders is a distinction afforded to only favored customers. For some cause not clearly understood the mill of the Bellville Nail Co. is not in operation. It will be rembered that this company signed the 21¢ scale, and that the president, Dr. Waugh, died recently. From the report of the Western Nail Co. it appears that their output of Nails has been increased to 1500 kegs per week under the 17¢ rate.

Wire.—The local supply has been largely increased by shipments from Cleveland, and there is now no scarcity of Wire for barbing. Most of the shipments arriving are on orders placed before the recent advance. The firm prices on Foreign Rods, the usual demand of fall trade and probability of higher freight rates upon the closing of the canals all tend to make higher prices.

Barbed Wire.—Prices of the Unlicensed Wire have been unsteady during the week, in consequence of an endeavor to force sales of large quantities. The situation is unusual and is evidently the result of some factories having too large loads to carry. Possibly the anticipation of the trial of some of the numerous suits involving patents said to cover both the Barbed Wire and Machinery may have had some influence, although it does not now seem likely that the cases will be set for trial during the present month, as Judge Brewer left for Leavenworth on the 2d inst., and intends going to Denver to hold court during the illness of the judge of that district. Prices are unsettled, and it remains to be seen how much Wire there is to be immediately disposed of before any prices can be called market. The price of Plain Wire and the season should lead to higher prices, and the refusal of many manufacturers to meet the low figures, it is hoped, will restore consistent prices.

Spelter.—Smelters show less anxiety to secure orders, and there appears to be a firmer tone, although prices are not without considerable variation, $4.25 here being asked.

Lead—Has been quiet, with steady prices on both kinds, no concessions having been reported on the Common. To-day prices are $4.12½ for Refined, and $4.10 for the Hard, f.o.b. St. Louis.

Among recent direct imports through the St. Louis Custom-House are the following: Bridge & Beach Mfg. Co., 441 boxes Tin Plate, Liverpool; St. Louis Stamping Co., 1389 boxes Tin Plate, Liverpool; Simmons Hardware Co., 9 cases Sporting Goods, London; 1 case Carving Tools, Sheffield; 1 case Chesterman's tapes, London; Hubbell & Randall, 6 cases Cutlery, Bremen; A. J. Jordan, 5 cases Cutlery, Sheffield.

W. H. Shields, 305 Olive street, St. Louis, reports as follows, under date of October 5, 1885: There is no change in the general condition of the market. While prices in some lines are firm, they show no quotable advance. The demand for Old Material is somewhat active:

CHARCOAL FOUNDRY.		
Missouri	$15.00 @	$16.00
Southern	16.00 @	17.50
COAL AND COKE FOUNDRY.		
Missouri	14.00 @	16.00
Southern	15.00 @	17.00
American Scotch	16.00 @	19.00
MILL IRON.		
Missouri	14.50 @	15.00
Southern	13.50 @	14.00
CAR-WHEEL AND MALLEABLE.		
Southern	20.00 @	24.00
Lake Superior	20.00 @	28.00
SCRAP, ETC.		
Old Car Wheels	13.75 @	14.25
Old Rails, Iron	16.75 @	17.00
Old Rails, Steel	15.00 @	15.25
Wrought Scrap, No. 1	.55 @	.65
Cast Scrap, No. 1	.45 @	.55
Connellsville Coke (East St. Louis)	5.30 @	....

Louisville.

W. B. Belknap & Co., Louisville, under date of October 5, 1885, report as follows: While the month of September was a fairly good one in business circles, it did not fulfill in its close the brilliant promise of its inception. Trade has undoubtedly slackened somewhat, as the prospects of an extremely large agricultural yield in the Southern States have given way to more moderate estimates. The drought early in the season affected a large area, and the superabundant rains of late have spoiled a great deal of ripening cotton. Merchants are somewhat apprehensive, and are accordingly reducing their purchases. The only article of which there is not a good supply is Nails, and they are dealt with very gingerly, as the productive capacity of the mills, once employed, will readily give the country more than it wants. *Bar Iron.*—Some of the mills are attempting to obtain better prices, but this is not an easy matter; people have confidence at the old figures, but not very much in the new, and it will take some time to educate them up to them. Pig Iron, to which we have to look for any permanent improvement in the general line, is scarcely any stronger, although an advance of 50¢ a ton is claimed by the sellers. Large contracts have undoubtedly been made, but they were readily taken by the furnaces to assure them full occupation. In short, any idea of a boom is pretty much abandoned by such as held it, and we must draw on our stock of patience still further. *Hoops and Bands.*—The manufacturers of these specialties claim to have large orders and have succeeded in establishing an advance of about $2 ℔ ton. *Sheet* is in more abundant supply, particularly the light numbers, but there is no excess of the article in general; in fact, the mills seem to have hard work to supply the immediate demands for general assortment. *Nails.*—As we mentioned above, the condition of Nails is still interesting. The production of both Iron and Steel is so very limited as to afford little relief to a bare market. Still prices have not advanced inordinately, as the Southern mills are all busy, and the Eastern mills delivering their product in fair quantities. A number of parties holding Nails are now realizing on them, which goes to ease the market, and buying is reduced to the absolute necessities of the hour. *Wire.*—Notwithstanding the flourish of trumpets about the reduction of discounts made by the New York meeting, the indications are not such as to encourage faith in much of an advance. There is a small one, but it has resulted in little more than taking up what slack there was in the market before. Instead of large sales that were hoped for, there is barely more than make a good jobbing movement. Recent rains, though needed in the agricultural districts, have been so continous and bountiful that they have done much to retard the free movement of goods. A few days of dry weather may do much to give a different color to our reports.

George H. Hull & Co., of Louisville, report to us as follows, under date of October 6, 1885: *Pig Iron*—The market continues very firm. Many furnaces are sold so far ahead that they have declined to sell some grades further unless at an advance of 25¢ @ 50¢. Some sales have already been made at the advance, though we do not raise quotations, as other furnaces are selling at prices current last week. We quote for cash in round lots as below:

PIG IRON.		
Southern Coke, No. 1 Foundry	$16.00 @	$17.00
" No. 2 "	15 00 @	16.00
" No. 2½ "	14.00 @	14.50
Hanging Rock Coke, No. 1 Foundry	15.75 @	16.25
Hanging Rock Charcoal, No. 1 Foundry	19.00 @	20.00
Southern Charcoal, No. 1 Foundry	17.00 @	18.00
Silver Gray, different grades	14 00 @	15.50
Southern Coke, No. 1 Mill, Neutral	13 50 @	13.75
" " No. 2 " "	12.50 @	13.00
" " No. 1 " Cold Short	12.50 @	13.00
Southern Charcoal, No. 1 Mill	16.00 @	17.00
White and Mottled, different grades	11.00 @	12.25
Southern Car-Wheel, standard brands	23.00 @	24.00
Southern Car-Wheel, other brands	18 00 @	20 00
Hanging Rock, Cold-blast	23.00 @	24 00
" Warm-blast	18.00 @	20 00

Old Material.—The market for Scrap Iron continues quiet, but with more demand and without change in price. We quote for cash in round lots as below:

Rails, ℔ ton	$16.00 @	$16.50
Wheels, ℔ ton	13.00 @	14.00
No. 1 Wrought, ℔ 100	.65 @	.70
Country Wrought, ℔ 100	.50 @	.60
No. 1 Cast, ℔ 100	.50 @	.55
Boilers, cut, ℔ 100	.60 @	.65
Boilers, uncut, ℔ 100	.40 @	.45
Axles, ℔ 100	.90 @	.95
Flues, Tanks and Sheets, ℔ 100	.30 @	....
Burned Scrap, ℔ 100	.20 @	.30

Detroit.

Charles Himrod & Co., dealers in Pig Iron, Detroit, Mich., report, under date of October 5, 1885, as follows: The most noticeable feature in the market last week was the effort on the part of the Southern men to maintain an advance, they claiming to be pretty well sold up for all their furnaces can make during the present year, but notwithstanding these facts it leaked out that they were making contracts at market prices for delivery extending in some cases for 12 months Our Jackson County friends, who have a large hold on the Stove trade here, have not yet found the bottom, and lower offers seem to be made now than 30 days ago. The best brands of Mahoning Valley Iron have advanced 50¢ ℔ ton, and make no deviation from these prices. No. 1 Irons are particularly short in supply. The majority of the Standard Lake Superior Charcoal brands maintain their high attitude—that is, in proportion to what the market is forced to be through the efforts of a number of furnaces who are compelled to realize—and there is not so much actual accumulation among the high-priced furnaces as one would be led to believe, and frequently sales are made at from $1 to $1.50 above what is generally accepted as market price. Demands for Old Rails as winter is approaching seem to have increased, and we predict a gradual advance on this class of material. For round lots on four months' time we present the following:

Lake Superior Charcoal, Nos. 1, 2 and 3	$19.75 @	$20.25
Lake Superior Charcoal, Nos. 4, 5 and 6	20.00 @	21.00
Lake Superior Coke, All Ore	19.00 @	19.75
Lake Superior Coke, Cinder Mixed	17.00 @	17.50
Standard Ohio Blackband	19.00 @	19.75
Southern No. 2	16.50 @	17.25
Southern Silvery, Open	16.25 @	16.50
Southern Silvery, Close	15.50 @	16.00
Jackson Co. (Ohio) Silvery	17.50 @	18.00
No. 1 Southern Mill	13.00 @	14.00
Old American Rails, Iron	18.50 @	19.50
Old Wheels	15.00 @	16.00

A dispatch from Pittsburgh states that an intelligent Chinaman from San Francisco had gone to the Connellsville coke regions to negotiate for the employment of Chinese labor in that district. He is one of a committee of six appointed at a recent meeting in San Francisco to visit the various industrial centers throughout the country to establish Chinese colonies. The movement grows out of the late Wyoming massacre. He reports having met with fair success at Cincinnati and other localities visited.

Trade Report.

General Hardware.

The changes in price during the past week have not been many, but several lines give indications of a firmer feeling. Manufacturers of many leading goods which have been very low are withdrawing their extreme quotations, and in some cases asking higher prices. So that the market, with some announced advances, is characterized by a good tone and a hopeful feeling that with the continuance of a fair demand the present improvement may be held, and may lead to a still more satisfactory condition of things.

BARB WIRE.

The market has been quiet and steady during the past week. Reports from the South and the Southwest show the continuance of a heavy demand in that quarter. We quote for carload lots of licensed Galvanized Four-Point Barb Wire 4.35 cents to 4.40 cents, and 4.55 cents to 4.60 cents for small lots.

NAILS.

Nails are getting decidedly scarce, and the assortments are not full, 10d., and notably 20d., being in short supply. The demand, which is moderate for the season, is for small lots to cover immediate requirements exclusively. We quote $2.30 @ $2.40 from store, the former for large and the latter for small lots. The features affecting the market remain the same. In the West the situation is apparently the same, though the demand from that quarter is expected to show some decline, since recent shipments were heavy in anticipation of an advance in freight rates. The situation in the West, as it existed a week since, is admirably summarized by a manufacturer in the following letter:

The Western Nail manufacturers have a question of vastly greater interest at stake in the present labor contest than that of the number of machines operated or the comparative product of Nails per machine, as between the product of the new nailers and the old nailers, or even the supply of the trade. The discrimination between the labor paid by Nail manufacturers east and west of the Alleghany Mountains has assumed such proportions as to compel the Western manufacturers to demand an approximate equalization of and in all similar classifications of labor performed. This is the question that must of necessity be determined either by an advance of labor East or a reduction of labor West, the difference in the cost of labor East and West at present per keg of 10d. Nails being actually 28 cents in favor of the Eastern Nail manufacturer. There are at present 31 Nail works west of the Alleghany Mountains, representing 2980 Nail machines, and one Nail works destroyed by fire, not yet rebuilt, having 44 machines. One Nail works, the Bellaire, of Bellaire, Ohio, having 114 machines, are running; they signed the 21-cent scale in June, carrying out an arrangement entered into last January with their nailers, by which the move then made of demanding an advance of 20 per cent. for cutting Steel Nails over prices paid for cutting Iron Nails was defeated. Four other small factories not co-operating with the Western Nail Association, operating a total of 135 machines, none of which have signed the 21-cent scale, are running their machines. This leaves 26 Nail works in the West, not including the five above referred to Ten of the 26 mills are now being operated on the manufacturers' compromise—scale basis of 17 cents per keg for cutting 10d. Nails. These 10 mills represent 1272 machines, 400 of which are being operated, producing 85 per cent. of former work done by old nailers. These 10 mills are increasing product as men can be had to work on manufacturers' scale. Seven of these 10 mills are operating their heating furnace and rolls, while the remaining 16 Nail works, representing 1342 machines, are idle, and will remain so until the present contest is ended, which is not likely to occur until the manufacturers' scale is adopted.

Among the works running non-union are the Centralia Iron and Nail Works, of Centralia, Ill. Among those operating some machines with feeders are the Belfont Iron Works Co., of Ironton, Ohio, and the Norton Iron Works, Ashland, Ky. Associated Press dispatches state that P. L. Kimberly & Co, of Sharon, operating 40 machines, have conceded the 21 cent basis. This statement is as yet unconfirmed.

As we go to press a dispatch is received from our Philadelphia correspondent announcing that the card rate for Nails has to-day been advanced to $2 50.

CORDAGE.

The manufacturers of Cordage have, under date October 5, 1885, issued the following revised list, in which it will be perceived that an advance of ½ cent per pound is made in the price of Sisal Rope, there being the usual discount to the trade of 1 cent per pound:

Manila Rope.

	Cts. per lb.
1¼ inch cir. and upward	18½
12 thread, or ⅝ inch diameter	14
6 and 9 thread. or ¼ and 5-16 inch diameter.	14½
Hay Rope, 2, 3, 4 or 5 thread	18½
Bolt and Point Rope	15
Tarred Rope and Lath Yarn	18
Stave, Leather and Hop Twine	14

Sisal Rope.

1¼ inch cir. and upward	9
12 thread, or ⅝ inch diameter	9½
6 and 9 thread, or ¼ and 5-16 inch diameter	10
Hay Rope, 2, 3, 4 or 5 thread	9
Tarred Rope	8½
Single-Ply Lath Yarn	8

Russia Hemp.

White Rope	17
Tarred Rope and Ratline	11
Spun Yarn	10½
Bolt Rope	18
Marline, Houseline, Rounding and Hambroline	15
Packing	16

American Hemp.

White Rope	18
Tarred Rope and Ratline	12½
Spun Yarn	12
Lath Yarn	12½
Packing	17
Marline, Houseline, Rounding and Hambroline	16
Sash and Bell Cord	25 to 35

Italian Hemp.

Packing	20
Tarred Rope	16

Jute.

Rope and Packing	8

Oakum.

Best Oakum	8
U. S. Navy	7¼
Navy	6¼

MISCELLANEOUS PRICES.

James Hill, Providence, R. I., whose branch office is 97 Chambers street, New York, under the management of E. A. Bolmes, has issued a price list of Star Ash Cans, Garbage Cans and Star Galvanized Pails, the latter giving the weight per dozen. Of the Star Galvanized Pails two qualities are made, the difference being that the Patent Heavy Pail is made with an additional hoop spun on inside the bottom, 1/16 x ½ inch band iron, and that the bails, bodies and ears are heavier than in the Light Pails These Pails are made either with enameled wood handles or without, and with ears above or below the rim, points which could be specified in ordering. The list is as follows, subject to a discount of 45 per cent.:

Light Weight.

Quarts	10	12	14
Weight per dozen	34 lbs.	37	40
Price per dozen	$5.00	5.25	6.00

Heavy Weight.

Quarts	10	12	14
Weight per dozen	36 lbs.	39	48
Price per dozen	$5.50	5.75	6.50

Most of the manufacturers of Scythes have issued price lists in conformity with the recently-established prices, which it is expected will be adhered to by all. The association includes all the manufacturers in this line of any importance, and is understood to be in successful and harmonious operation.

The price of Screws is decidedly firm, the late advance being well maintained. The fact that it was made by the concerted action of the leading manufacturers is regarded as indicating the cessation of the extreme competition that has prevailed, and a disposition to maintain remunerative prices.

The market for Wire is firm, the recent advance having given it a much better tone. Another conference of the manufacturers was held in this city yesterday, when in addition to reaffirming the prices adopted at the former meeting, an advance was made in the price of Strand Wire for barbing.

At a meeting of the Bright Wire Goods Association, recently held in this city, it was decided to make an advance in the price of the goods, the discount of 70 and 5 per cent. and an additional 10 per cent. for cash in 30 days, to take the place of the former discount of 70 and 10 and 10 per cent. Action was also taken looking to the maintenance of the advanced quotations, which will probably be as well adhered to as the former prices. The increased cost of Wire is referred to as one of the causes leading to this advance.

The St. Louis Shovel Co., St. Louis, Mo., under date September 28, issue a notice of the withdrawal of all previous quotations for their manufactures, with the request that their customers, when in the market for this class of goods, will correspond with them and receive their lowest prices.

The manufacturers of Green Wire Cloth report an unusually active and early demand for next season, some of them having booked orders for nearly their entire production. There has been no important change in price, but it is not unlikely that if Wire maintains its advance higher figures will prevail for the Cloth.

COAL HODS.

We give below the lists and discounts on Coal Hods of Sidney Shepard & Co., the Central Stamping Co. and the Iron Clad Mfg. Co., which will be of service to our readers as giving information on this seasonable line.

Sidney Shepard & Co., Buffalo, N. Y., issue the following list on these goods, which is subject to a discount to the retail trade of 45 and 10 per cent.:

Open—Plain.

Inches	15	16	17	18	20
Black, per doz	$4.50	4.85	5.50	6.00	7.50
Inches	15	16	17	18	20
Galvanized, per doz	$6.50	7.00	8.00	8.50	10.50

Open—Bronzed Bands.

Inches	15	16	17	18	20
Black, per doz	$5.25	5.50	6.25	6.75	8.50

Funnel—Plain.

Inches		16	17	18
Black, per doz		$6.75	7.25	7.75
Inches		16	17	18
Galvanized, per doz		$9.25	10.00	10.50

Funnel—Bronzed Bands.

Inches	16	17	18
Black, per doz	$7.50	8.00	8.50

Funnel—Fancy—Bronzed Bands.

Inches	16	17	18
Black, per doz	$12.75	13.25	13.75

Helmet—Bronzed Bands.

Inches	17	18
Black, per doz	$8.00	8.50

Helmet—Fancy—Bronzed Bands.

Inches	17	18
Black, per doz	$13.25	13.75

Covered—Fancy—Bronzed Bands.

Black, 18 inches, per doz	$27.00

The Iron Clad Mfg. Co., 22 Cliff street, New York, are selling Coal Hods from the following list, which is subject to a discount of 70 per cent.:

The Langtry Coal Hod.

Japanned.	Per doz.	Galvanized.	Per doz.
15-inch	$8.25	15-inch	$11.50
16 inch	8.75	16-inch	12.50
17-inch	9.50	17-inch	13.50
18-inch	10.00	18-inch	14.50

The Langtry Funnel Coal Hod.

Japanned.	Per doz.	Galvanized.	Per doz.
15-inch	$12.00	15-inch	$15.00
16-inch	13.00	16-inch	16.00
17-inch	14.00	17-inch	18.00
18-inch	15.00	18-inch	20.00

The following Hods are described as made of their old pattern Iron Clad, and of 23 gauge Iron, and weighing 50 per cent. more than the Langtry. They are intended for hotel, restaurant, railroad and steamship use. The list prices are subject to a discount of 50 per cent:

Iron Clad Coal Hods.—Extra Heavy.

Japanned.	Per doz.	Galvanized.	Per doz.
15-inch	$8.25	15-inch	$11.50
16-inch	8.75	16-inch	12.50
17-inch	9.50	17-inch	13.50
18-inch	10.00	18-inch	14.50

The Funnel Hods named below are subject also to a discount of 50 per cent.:

Iron Clad Funnel Coal Hods —Extra Heavy.

Japanned.	Per. doz.	Galvanized.	Per doz.
16-inch	$13.00	16-inch	$16.00
17-inch	14.00	17-inch	18.00
18-inch	15.00	18-inch	20.00
19-inch	16.00	19-inch	22.00

A discount of 70 and 10 per cent. is made on the following, which are described as measuring 1 inch larger than they are marked:

Ladies' Favorite, Improved.

Japanned.	Per doz.	Galvanized.	Per doz.
15-inch	$15.00	15-inch	$19.00
16-inch	16.00	16-inch	20.00
17 inch	18.00	17 inch	22.00
18-inch	20.00	18-inch	25.00

The Central Stamping Co., New York, issue the following list, which is subject to a discount of 10 per cent.:

Galvanized.		*Galvanized Funnel.*	
15 in	$4.00	16 in	$5.15
16 in	4.20	17 in	5.50
17 in	4.50	18 in	5.65
18 in	4.80	19 in	6.00
Galvanized Oriental.		*Japanned.*	
18 in	$6.10	15 in	$2.50
19 in	7.00	16 in	2.60
20 in	7.80	17 in	2.75
Japanned Oriental.		18 in	3.00
18 in	$4.20	*Japanned Open Filleted.*	
19 in	4.60	15 in	$3.35
20 in	4.85	16 in	3.40
Japanned Half Covered, Fancy.		17 in	3.60
15 in	$8.75	18 in	3.80
16 in	9.00	*Japanned Funnel Hods.*	
17 in	9.50	16 in	$3.35
Japanned Oriental, Fancy Ornamented.		17 in	3.40
18 in	$6.50	18 in	3.60
19 in	7.00	19 in	3.80
20 in	7.50		

They allude to these Hods as made after a new and improved pattern, whereby room is saved in packing, and strength and durability secured.

WHAT THE TRADE SAY.

The following letter is from a gentleman representing a very large jobbing house who has a wide acquaintance in the trade, and whose views and observations are entitled to weight:

I am gratified indeed to see that the effort that was made to injure *The Iron Age* on account of its publication of its Trade Report and Price Current has fallen flat From the standpoint of a salesman I always prefer to "talk business" to a merchant who is posted, and I find that constant readers of our trade papers are the most intelligent class of trade and the most satisfactory to have business transactions with. Trade in this section is fair at present, but the outlook is most encouraging indeed. The corn crop was never surpassed, and the past two weeks of beautiful weather have put it out of the reach of frost. Merchants and farmers are all good-natured and I feel assured that our fall trade will be good, and that after the turn of the year there will be a turn upward in prices and an increase in the volume of trade. This I hear talked on all sides and by men of observation and good judgment.

The matter of so-called wholesale houses selling to consumers and interfering with regular retail trade is attracting some attention, and many of our correspondents allude to it. A house in Pensylvania who referred to the matter before says:

I wrote you some time since in regard to would-be wholesale men that do a regular retail trade. I had not read or seen anything in regard to it from any one else, so I supposed it was local, but I now find it is getting more general. I am heartily glad that others are awaking up to the situation. I said then and say now that these retailers who are trying to do a wholesale business are a great injury to the manufacturer as well as the retailer, and until quantity discounts are made for such an amount that they cannot have the goods this eternal cutting and slashing will continue. Every town of 3000 inhabitants in this part of the country has its retailers that have one man on the road wholesaleing, and then they cut and slash the retail trade all to pieces. I hear day after day from customers that so and so offers to sell them goods cheaper than any one else in town, saying that he can make his living from his wholesale trade, and is willing to sell cheaper than any one else. How do manufacturers expect retailers to make a living? Those very men that howl the most and find the most fault with trade papers for giving prices to retailers are just those would-be wholesalers that want every one else to be kept in the dark, and no one protected but themselves. Now, if manufacturers expect good wholesale houses to maintain prices as long as such things occur they will be disappointed. Their best trade comes from the retailers who have to do business alongside of these would-be jobbers, and, if they do not sell to us on such terms that we can realize a profit and hold our own, how are we to do business?

The following reference to trade comes to us from one of our subscribers:

Traveling men have nothing of encouragement to give in the way of reporting improvement in trade, but seem to go, as the wandering Jew, from necessity. I have been surprised to see how few goods I have had to buy to keep up my assortment for the last few months. It is true sales have been small in quantity and volume, and I am inclined to think that I have been carrying too large a stock. This experience may have come to others with equal advantages, and this knowledge will be of future service to them.

A manufacterer making a line of goods of acknowledged excellence, referring to the volume of business at the present time as light, says:

One reason which we assign for this is that the jobbers are buying no matter what as long as it is cheap, taking the word cheap in all its varied meanings, and that we cannot follow some of our competitors to the bottom of the ditch. The class of goods which we make is acknowledged to be superior to others. This superiority means money, time and labor to make them so, and hence we cannot compete with every one in price. Our retail trade, however, is highly satisfactory, because the consumers find that it pays to buy direct from the manufacturer, and our extensive advertising is bringing us our share of the business.

ITEMS.

Dame, Stoddard & Kendall, Boston, Mass., issue their 1885–86 catalogue of Winslow Skates and Forbes Patent Acme Club Skates. A full line of the Winslow Ice Skates is given, with illustrations and list prices. Among these is the new Lever Ladies' Skate, made under a recent patent. The Acme Club Skates, so well known to our readers, are also described, and a line of the Vineyard Roller Skates.

The advertisement of Farley & Hoffman, successors to the Stein Showcase Works, Rochester, N. Y., will be found on page 6, from which it will be seen that they are making a full line of Showcases, concerning which they will be pleased to give definite information to those desiring it.

Nash & Bro., Millington, N. J., issue a pamphlet on "How to Avoid Difficulties of Climate," in which they allude to the special features and advantages of the Acme Pulverizing Harrow.

The advertisement of Dame, Stoddard & Kendall, Boston, in which they illustrate the Kempster Roller Skate, will attract the attention of our readers, who will note the novelty and convenience of the construction of this Skate, and especially its duplex adjustment.

The Triumph Wringer Co., Keene, N. H., have removed to more commodious quarters, where, with the addition of new machinery recently purchased, they will be able to handle their business with greater convenience and dispatch. Their Wringer, our readers will observe, is illustrated on page 7.

The Yazoo *Sentinel*, Yazoo, Miss., refers in a recent issue to the enterprise and growth of Crane Brothers & Co., the extent of whose business is alluded to editorially, and whose varied line of goods is indicated in the advertising columns of the paper. The same paper also contains a good deal of matter in regard to the business interests of Yazoo County and Yazoo City.

Our readers will observe the advertisement of Sidney Shepard & Co., Buffalo, N. Y. on page 32, in which they call attention to the fact that they are agents for the Chesapeake Nail Works, a line on which they solicit correspondence.

The Goodell Co., Antrim, N. H., during the summer built an addition to their shop at Bennington, N. H., where their heavy work, such as cutting up steel, forging and grinding, is done, and also erected a 2-story brick building at Antrim, to be used as a storehouse. New machinery has been put in, and they advise us that they are now able to turn out nearly double the quantity of goods they could a year ago, and are at present employing about 200 hands. This indicates a very satisfactory condition of things in what has been with many an apparently quiet season. Much of their work is done on patented machines invented in their shops, and they refer to the advantage these goods have, not only in the quality of the work, but also the rapidity with which it is turned out. They refer especially to the favor with which their Eureka Apple Parer, Corer and Slicer, of which we gave a description some time ago, is being received by the trade and those in the evaporating industry.

Peabody & Parks, of Troy, N. Y., who for several years past have been the authorized Eastern agents of W. J. Clark & Co., of Salem, Ohio, for the sale of their well known Family Oil Cans, have recently made arrangements by which for the future they will manufacture their own goods. The Cans produced, while embodying the essential features of the goods made in the Salem shops, will have some peculiarities of their own in style and character. The manufacture was commenced during the past summer, and in fitting up their factory for the purpose the firm spared no expense in machinery or appliances. Among the recent improvements they have made in the Cans they call attention to more perfect pumps, a more convenient method of filling and a more substantial jacket than was formerly employed. The Plain Cans are lacquered, thus improving their appearance and avoiding the danger of rust, while Cans made of Crystallized Tin are handsomely decorated by hand painting.

The Knapp & Cowles Mfg. Co., successors to the Cowles Hardware Co., Bridgeport, Conn., in their new catalogue represent the line of their goods with which the trade is familiar, with some additions, and in a convenient and attractive form. In their introductory circular they refer to the fact that they have built a new and commodious factory during the last year and moved their entire business to Bridgeport, Conn., where water and rail freights are advantageous for quick delivery. They have also added new and improved machinery and increased their line of goods. They call attention especially to their Screw Drivers and Mincing Knives, alluding to them as having been on the market for 50 years, and also to their Hercules Door Spring and their Double and Single Acting Spring and Blank Butts as embodying a new principle which is highly indorsed by their patrons. They mention also their complete line of Brace Screw Drivers, Reamers and Countersinks, and call attention to their addition to their line of Household Goods and their specialties in Hardware.

The Concord Axle Co., Penacook (Concord), N. H., have recently issued a catalogue of their Axles, in which the various styles they make are illustrated, with list prices. Among the different goods which they thus bring to the attention of the trade are the Original Concord Axles and the Concord Express Axles. The former they allude to as the well-known reliable loose collar Axle, and the latter as the latest improved form of solid collar Axles, and as an especially desirable article. They also describe in a special circular Brown's Improved Collings Axle, which is made under a recent patent and intended for fine carriages and coaches. It has double washers at each end of box for the purpose of insuring efficiency in retaining oil and excluding dust, but to its special features we shall call the attention of our readers hereafter.

The John Fearnley Mfg. Co., Cincinnati, Ohio, having unfortunately lost their new factory by fire, as we announced last week, advise us that a large force of men was immediately employed and have since been at work, so that it is expected that manufacturing will be resumed in a week or two. The fire found them, they advise us, behind their orders and with a steady demand, the prospects for fall trade being unusually good. But it is expected that they will soon be in a position to take care of their customers.

The Clement Mfg. Co., Northampton, Mass., advise us that they are now making an addition of Solid Steel Handle Cutlery of a fine grade, of Rubber-Handled Knives, and also a new Druggist's Spatula, with patent rest and balance.

The Rochester Kerosene Burner Company, 419 E. Main street, Rochester, N. Y., are manufacturing the Shaffer Perfection Burner, which they describe as simple in construction and easily managed. The Burners use flat wicks, and are so constructed that they receive an inside draft of air through the Burner itself, which arrangement the manufacturers refer to as producing a more perfect combustion, and consequently a greater illumination, from the same quantity of oil burned.

Morehouse, Wells & Co., Decatur, Ill., issue a series of circulars and price lists relating to goods which they sell. The articles mentioned are the "Favorite" Stove-Pipe Damper, the Corrugated Stove-Pipe Elbow, Spool Wire of various sizes and kinds, "Black Lustre" Stove Polish, the "Lustro" Metal Polish, &c.

SHEFFIELD VS. AMERICAN CUTLERY.

A letter recently appeared in the London *Ironmonger* from Sheffield, giving the views of their correspondent, who had recently returned from the United States, in regard to the relative position in this country of American and English Cutlery. His representations were to the effect that the American manufacturers of Table Cutlery were doing an exceedingly limited business, their trade being in large measure taken from them by the sale of imported goods, which were alluded to as occupying the market almost to the exclusion of those made here. This statement, which will be recognized by all our readers as inaccurate and evidently written under strong prejudice or very partial information, was controverted by the correspondent in this city of the paper in which it was published. This called out a reply from the Sheffield writer, from which we take the following extracts as giving his argument on the question, and which will be of some interest as relating to the whole matter as seen from the English standpoint:

I said, writing on June 13, that "the improvement in the orders for Cutlery from the States was more or less maintained," and that it seemed to be less the result of an increased consumption than of the recent collapse of several of the American Cutlery companies. I am told that there has been no improvement in the orders for Cutlery from the States "for many years." Well, that is open to question, as I will show in a moment by figures. But anybody who reads my weekly letter knows that in speak- of an "improvement" in American orders I was speaking relatively, and subject to the great depression which has for at least two years curtailed the trade with the States, as with other markets. Soon after the installation of President Cleveland there was a certain increase in the orders which came in from America, though it was nothing like sufficient to restore the demand to its normal limits. But when your correspondent declares that there has been no improvement in orders from the United States "for many years," he makes a premature dash for a position which I may as well secure against him at once. The returns of the Cutlery exports from Sheffield to the States for a series of years ending with September 30, 1884, are as follows: 1876, $658,885; 1877, $706,671; 1878, $729,550; 1879, $808,119; 1880, $1,16 ,173; 1881, $1,359,704; 1882, $1,332,674; 1883, $1,251,584; 1884, $953,402. Now these figures are simple and eloquent; they clear the ground of a good deal of inde-

terminate talk. They show that the Sheffield manufacturers have increased their Cutlery trade with the States at such a rate during the last 10 years that in 1881 and 1882 their exports were more than double what they were in 1876. Two years ago the contracted consumption of goods of all kinds caused the demand to decline, but surely that is not enough to bear out the statement that there has been no improvement in American Cutlery orders "for many years."

He says that, "so far as Table Cutlery is concerned, the business is so restricted as to amount to practically nothing;" that "there is a limited demand for certain high-grade goods" (due to prejudice); that Rodgers' Carvers and a few others sell in America, "but not in increasing amounts," thanks to sharper native competition, and that he "doubts whether any set of Carvers was ever produced in Sheffield which for quality, finish, or intrinsic value could not be equaled by the product of American works." Now, if these statement and suggestions mean anything, they mean that the American Cutlery companies have wrested a large trade in high class goods from the hands of the Sheffield makers, and that they could take the rest if mere quality had fair consideration. Upon these assumptions I have a question or two to put. Of what does the great increase in the Cutlery exports from Sheffield between 1876 and 1882 consist? what has caused the 50 Ivory-Handled Table-Knife cutlers who were formerly employed by the Meriden Company to dwindle to two or three? and how is it that there is now in the cellars of Sheffield firms Ivory which has crossed the Atlantic twice, having been bought in the first instance for American Cutlery firms, and subsequently reshipped to Liverpool on finding that the Ivory-Handled Cutlery trade of the States had become too impoverished to absorb it? As to the ability of American makers to produce Carvers equal to those of Sheffield, I will relate an incident which occurred not long ago in a local Cutlery establishment. An American workman, through whose hands the best work of a large American firm passes, strolling through the warehouse, picked up a Two-Pair Case of Ivory Carvers of the commoner class, with the remark, "I suppose you do not make many of these?" "Oh, yes, many a hundred cases," was the answer. "They belong to a class which we send over to the States at 36/ a case, whereas our best qualities run up to 60/ and 70/ a case." The visitor was surprised, and dropped the subject with the remark, "Well, we cannot touch these." If it be really true that American consumers are paying fancy prices for Cutlery which the home manufacturers can "equal" and do equal in all respects at lower rates, all that can be said is that the citizens of the Republic are much less practical people than we have given them credit for. But I take leave (with all respect to the opinion of your New York representative, whose weekly letters have gained for him a flattering reputation among local readers of the *Ironmonger*) to doubt it, and for this reason, among others, that, while your correspondent seems to ascribe the supposed success of the American makers to the fact that "American Steels" are "more popular" than English Steel, the American companies take care to advertise that their best Cutlery is made from the finest Sheffield Double-Shear Steel.

I saw yesterday a label taken from a parcel of American Cutlery, the most prominent line on which was to the effect that the goods were manufacted from the best Sheffield Steel, and I know that, notwithstanding the great decrease in the demand for English Bessemer, the consumption of Sheffield Crucible Steel in the States has only been curtailed by the shrinkage in production, caused by the depression, to which reference is so frequently made in the New York letter of July 8. I have passed over without remark the absurd contention, insinuated rather than plainly asserted, at a substantial portion of the Sheffield trade with America consists of "Carvers with Iron blades and imitation buck-horn handles." If American makers cannot, with their mechanical resources and abundant material, produce these things for themselves, their powers of competition must be poor indeed. The great bulk of the Sheffield business, and the class of trade which has largely increased and is increasing—at the expense, as I contend, of the American manufacturers—consists of the higher qualities of Cutlery, namely, best and medium makes of the Ivory grade, and superior common of the Ebonite-Haft type. At a lower ebb than this local firms cannot with the present tariff compete. They cannot and do not attempt to run Shell-Bolster and similar styles against the American makers. This, despite the curious contention put forward that the competition between English and American Cutlery is "not a matter of price," is distinctly a matter of price, and of price only. If it be true that "the American manufacturers have in few, if any, instances gone into the manufacture of cheap goods," it becomes an interesting question as to where the cheap goods consumed in the States come from. They do not go from Sheffield, as is shown by the following extract from a report of the American consul at Sheffield: "The high price of Ivory is greatly hampering the Sheffield Cutlery trade with America, especially as that trade is now largely restricted to the higher classes, in which Ivory is alone used." It is possibly true, as your correspondent says, that the American firms can produce "the most beautiful styles made anywhere," but beautiful style and sterling quality may be different things, as the Germans are constantly showing the world. But I would in return respectfully offer to him a word of caution as to his informants. He speaks of the "importers of English Hardware" as saying this and that with regard to Sheffield Cutlery. They are not the best judges, nor am I sure that they are quite unbiased ones. The Sheffield houses who do the bulk of the Cutlery trade with America transact their business through their own agents, and these are the persons best qualified to gauge the extent and character of the competition that is going on.

This called out a reply from the New-York correspondent of the paper, which appears in its issue of the 12th inst, and from which we make these extracts:

The figures of the Sheffield Cutlery imports into the United States which he publishes show that in 1876 the shipments were valued at $658,885. This I consider a small trade. In 1887 they were very little more, being only $706,671. In 1878 they had increased to $729,550. These three years cover a period of considerable trade depression. In 1879, when we began to feel the effects of revival, the Cutlery imports from Sheffield reached a total of $808,119. The next few years covered the period of the "boom," as it is called, when all kinds of imports were brought into the country in excess of the legitimate requirements of consumption, and to the great embarrassment of manufacturers and traders. In 1880 the Sheffield Cutlery imports were $1,161,173. In 1881 they were only a little greater, being $1,359,704. In 1882 they declined to $1,332,674. In 1883 they showed a further decline to $1,251,584. In 1884 they fell to $953,402. These comparisons show that since 1881 Sheffield Cutlery imports into the United States have steadily declined, and I have no present reason for believing that the total for 1885 will be even as large as for 1884. Your correspondent says: "These simple figures are eloquent; they clear the ground of a good deal of indeterminate talk." They show that, comparing 1884 with 1876, the total gain has been only about $300,000, which is not in ratio proportionate to the increase of population or the general expansion of domestic trade. These figures show to my mind very conclusively that what I said about the relative importance of Sheffield Table Cutlery in this market was well founded. Permit me, however, to remind my Sheffield friend and others that it is scarcely fair to include in comparative statistics as bearing upon the subject immediately under discussion the figures comprising all forms of Pocket Cutlery. My remarks were specifically addressed to the subject of Table Cutlery, and, although, I have forgotten exactly the form of words used, I believe I distinctly stated this fact in my first presentation of the case. I do not think that the American Pocket Cutlery manufacturers have thus far successfully competed with Sheffield. I know as a matter of fact that among buyers of Pocket-Knives in this country Sheffield makes have a decided preference. There is a considerable domestic manufacture of Pocket Knives, but only a comparatively small part of the production is first class. The average American Pocket-Knife will rate about midway between the best and the cheapest. I must decline, however, to concede the justice of the general accusations of your correspondents, "H. H." and "Trinchante," respecting the quality of American Table Cutlery. As a matter of fact, I know that leading jobbers of New York and Philadelphia find American patterns much more saleable than English, and that consumers have no fault to find with quality, and they buy makes for which excellence of quality is claimed. Styles are, of course, largely a matter of taste. I presume that Sheffield manufacturers prefer their own shapes, and I judge from letters of your correspondents that it is scarcely worth while to discuss this question.

Since the receipt of your August 15 issue I have shown the articles on this subject contained in it to a number of representative Hardware merchants of New York, both importers and jobbers of domestic goods. They have been read with interest, but in every case have called out the comment that the statements were mostly erroneous. They find particularly amusing the statement of your Sheffield correspondent that importers of English Hardware in this market are not good authority with regard to the popularity of and demand for Sheffield Cutlery. This may be so, but I fail to see where better authority could be obtained than among men who handle all the English Cutlery that comes to this market, and who are brought into daily competition with domestic makers.

But in the last issue of our London contemporary, which has come to hand since the above was written, we find the following letter from Newcastle, N. S. W., which will be of interest in this connection:

I have been led to pen this through reading the controversy on English vs. American cutlers. In those letters some of our English writers have said some hard things of our neighbors. Being a cutler myself and a seller of Cutlery, and having just visited Sheffield and America, and belonging to neither, I would most likely be an impartial witness. With regard to Table Cutlery, I saw that class of goods equal to anything made in Sheffield for style, finish and quality. The Plated Knife used in hotels is of good quality; the plating is done to save labor, for servants do not like the job of cleaning Knives, and this does away with it. One correspondent, speaking of Pocket Knives, said they were as hard as flint, and the next as soft as lead and the steel bad. Now this is hardly a likely story, when we know that our friends make Axes, Saws, Sheath Knives, Butchers' Knives and Table Knives, and all kinds of Carpenters' Tools—in fact, Edge Tools of all kinds that are not to be surpassed in the world; and to be told they cannot harden and temper the blades of a Knife is nonsense. However, I leave that to your readers to judge. With regard to Butchers' and Sheath Knives, the Americans have established a reputation for shape and excellence of quality. The American Green River Sheath Knife is known to sailors all over the world for excellence, and it is so well known that Sheffield makers stamp "Green River" on the blades of their Knives and try to sell them as American. So you see Sheffield makers can be guilty of little frauds, like other people. Then, with regard to stamping the word "Sheffield" on American-made articles, this is the last thing Americans would need to do, as the excellence of their own goods is so well known that they need not do this. We all know that "Sheffield" is not a hall-mark or a guarantee of excellence.

I will give you a couple of specimens of English brag, or ignorance, I do not know which. A gentleman in one of the Sheffield houses, speaking of Cutlery, said: "You see they cannot make Cutlery anywhere else like Sheffield, as our water is peculiarly adapted to this purpose. Now, if I sent this Steel and workmen to London and hardened and tempered it, then we could not depend on it." In another house, in speaking of Cutlery, a gentleman said: "They try to make Cutlery over in America, but they cannot compete with us." He spoke of the water also, but went a little further and said: "One of our Sheffield men can do as much in four days as they can do in six in America." Now, this does not agree with what I heard from English workmen in that land. They complained of having to work much harder than in Sheffield. One writer says he never knew a Yankee to come to Sheffield to work. Not likely, when in Sheffield houses that had 20 grinders only keep four now. In conclusion, whatever may be said or written on this subject, any person conversant with the trade knows it has left England forever—that is, the bulk of the Cutlery trade.

Coal Market.

The firmness of prices in the Anthracite Coal trade noted one week ago is still a feature in the market and in strong contrast with the situation previous to September. The recent advance, our wholesale dealers and operators affirm, is fully realized, at least as to the sizes most in demand, such as Egg and Stove, though, of course, the principal movement is on account of old orders. Dealers in the best brands of Lehigh are quite independent, claiming that they have no more Coal to deliver; otherwise, that their orders are up to their present capacity. Pittston is also in good demand. Reading has issued a new circular, as follows: Broken and Egg, $3.50, f.o.b. at Elizabethport, free-burning white ash; Stove, $4.10; Chestnut, $3.40; Pea is about $2.50. The general quotation for free-burning is about $3.25 for Broken, $3.35 for Egg, $3.85 for Stove and $3.25 for Chestnut. For the East there is more inquiry and freights are quoted higher. It is remarked that the Delaware and Hudson Canal Co., after a period of unusual dullness, are now forwarding Coal as rapidly as their facilities will permit. The attitude of the Pennsylvania Railroad Co. as concerns rivals in the trade remains unchanged.

The total amount of Anthracite Coal sent to market for the week ending September 26 was 758,579 tons, compared with 859,432 tons in the corresponding week last year. The total amount of Anthracite mined thus far in the year 1885 is 21,547,582 tons, compared with 22,110,734 tons for the same period last year, a decrease of 563,152 tons. The total amount of Bituminous sent to the Eastern markets thus far in the year 1885 is 4,241,515 tons, compared with 4,532,576 tons for the corresponding period last year, a decrease of 291,061 tons.

A meeting representing 80 % of the vessels in the Atlantic coasting trade was held in Boston on the 1st inst., and a form of bill of lading adopted advancing the rate of discharging Coal to 150 tons per day after 24 hours' notice to consignee of arrival of vessel; vessels to be discharged in turn; rate of demurrage reduced to 6¢ ℔ ton, in lieu of 8¢, as now charged. Another meeting will be held on the 15th inst. for the purpose of conferring as to a minimum rate of freight for the coming year on Coal carried by sailing vessels from the various Coal-shipping points to points north and east of the Capes of the Delaware.

Foreign Markets.

FRANCE.

PARIS, September 24, 1885.—*Metals.*—Business in general, and in Metals in particular, has been flat, owing to the proximity of the general elections. Copper has again gone lower, Tin has improved, Lead is steady and Spelter higher. We quote toward the close: *Copper.*—Chili Bars, 106.25 @ 110; Ingots and Slabs, 115; Best Selected, 118, and Pure Corocoro Ore, 112.50 francs ℔ 100 kg. *Tin.*—Banca, 248.75; Billiton, 246.50; Straits, 247; Australian, 247.50, and English, 240. *Lead.*—28.50 @ 29.50, and *Spelter*, 38 @ 39. *Iron.*—In this city the situation continues deplorable, in consequence of the competition between dealers, more lessly so, we may say, the price for Merchant and Flooring being barely maintained at 13 francs. At the North there is little doing, works usually taking stock there at this time of the year, which affords them a good pretext during these dull times for stopping work for a week or two. In the Meurthe and Moselle the little business in Pig there might be is absorbed by our neighbors the Belgians underbidding thereon. There is a good deal of complaint in the Ardennes; makers there complain that the many public works contemplated in this city are delayed, and that they are the main sufferers from this disappointment. In the Haute-Marne, and notably the Champagne, all combinations have proved futile; business remains stagnant at 14 @ 14.50 francs for Coke Merchant; Mixed sells at 15 @ 16; Machine do., at 16.50 @ 17. Wire Nails are weak at 24 @ 24.50, No. 18, and Chains are selling at the low figure of 23, Nos. 22 and 23. *Coal*—Gradually revives.—*Moniteur des Intérêts Matériels.*

BELGIUM

BRUSSELS, September 24, 1885.—*Iron.*—In spite of rather better advices since the beginning of the month from the United States and England, weakness and irregularity are still the predominating features in the Iron situation in Belgium in general, but in Liège at least some larger orders have dropped in during the week. At Charleroi, on the other hand, there seems to be no bottom to prices. Merchant No. 1 selling below 10 francs Even at such ruinously low prices there seems to be a lack of work in that district, several large works lying idle during several days in the week. Foundry Belgium Luxembourg Iron sold as low as 4.80, No. 3, and Puddling do. at 3.80. In the Hainhaut Beams were done as low as 9.50, and Sheets at 13 francs. At Charleroi in particular makers are alarmed and afraid of difficult times during the coming winter. Much will depend, of course, upon the turn which matters will take in Germany. If an agreement can be arrived at there between Westphalia and Silesia to curtail production materially we shall feel the effect of it soon so that the dull winter season may then be bridged over better than is apparent at present. Meanwhile English Pig has been much firmer at Antwerp at 4.65 @ 4.70. We are glad to mention the very important commands which have reached this country to supply the Panama Canal Co. with dredges, of which 20 altogether have now been ordered. *Coal.*—The Government has obtained its Coal very low—say at 4 francs, and since then there is greater steadiness at 4 @ 6.65 francs for Steam Coal.—*Moniteur Industriel.*

GERMANY.

HAMBURG, September 24, 1885.—*Iron.*—In sympathy with the better feeling in England and America for a month past, there has been an undercurrent, a greater strength, both in Rhenish Westphalia and Upper Silesia, the more so as there is now some prospect of arriving at an agreement between both Iron districts to curtail production, negotiations about which are still in progress. The only serious obstacle has so far been the Wrought-Iron Pipe interest claiming too many special privileges and indemnities considered rather unreasonable. Meanwhile quite a number of blast furnaces have been blown out in Upper Silesia, where Pig Iron has, therefore, a better tendency, and would indeed have improved but for the large stocks still in dealers' hands. Puddling Pig has been quite firm at Siegen, while Bessemer and Foundry have been weak there, and while Luxembourg has been shaded from the syndicate figure of 42 francs. As for Finished Iron in Rhenish Westphalia, it has been much more active, but ill-sustained, by virtue of the great competition among makers. Structural has done tolerably well, building still going on briskly in the larger cities. While Coarse Sheets remain neglected, Thin Sheets are in continued good request, with some improvement in prices. Boiler Sheets and Wire Rods are still drooping. Steel works are comparatively idle in all but Car-Wheels and Axles. Great activity prevails among machine shops and foundries, with orders largely booked ahead; this may also be said of Locomotive shops, less so of Car works. *Metals.*—Both Lead and Copper are weaker; Spelter steady, under a good demand.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, September 22, 1885.—*Tin.*—Without displaying much activity, the market has risen ½ @ ¾ guilder ℔ 50 kg., Banca being worth 55.25 @ 55.50, and Billiton, 55; while in Amsterdam, September sale, Banca Tin is offering at 55; Billiton, do. and spot at 54; December, 54½, and January, 54.75.—*Koch & Vlierboom.*

AUSTRIA

VIENNA, September 24, 1885.—*Iron.*—The Iron markets here and elsewhere in Austria-Hungary have relapsed into dullness; even the speculation for a rise in the shares of Iron works on 'change, alluded to in former reports, has subsided. Meanwhile Ironmasters have met at Festh, where some plan may possibly be arrived at to place production on a sounder basis. Our market has been steady and firm, with an undercurrent of confidence in the near future, the argument being that, with the extraordinary crops harvested in Austria-Hungary this year, Iron, Hardware and Tools can hardly fail to speedily give signs of decided improvement. We quote Pig, 47 @ 56; Merchant, 105 @ 125; Sheets, 160 @ 175, and Beams, 105 @ 115 florins ℔ ton.—*Austrian Trade Journal.*

AUSTRALIA.

SYDNEY, N. S. W., September 19, 1885.—*Iron and Hardware.*—The market continues dull and heavy, the demand for consumption being light and dealers not feeling disposed to operate unless it be at a material decline. Meanwhile importers show little inclination to yield; hence the stagnation.—*Per cable via London.*

CHILI.

VALPARAISO, August 7, 1885.—*Copper.*—The exchange market tending downward and producers being free sellers, a large business has been done; later on the exchange market recovered slightly and cable news from England quoted Copper lower, causing part of the advance to be lost. At one time Copper receded to $18.10, but closes at $18.30. This, with 30/ freight, equals £43 in England. Week's sales meanwhile sum up 47,500 quintals. *Nitrate.*—Soon after the departure of the last fortnightly mail the price advanced to $4.05 @ $4.10 for 95 %, but, the cable reporting a very quiet market on the other side, ours became sluggish. Yet the outside figure was nevertheless sustained to the close, which is equal 10/9¾ in England, with a freight rate of 26/3. Sales sum up 552,500 quintals. Since August 24 some 13,500 tons were chartered for Europe. *Coal* has been inactive at 24/ @ 26/ for West Hartley and 19/ @ 22/ for Australian. *Exchange*—90 days, 24¾d.—*Weber & Co.*

EAST INDIES.

PENANG, August 21, 1885.—*Tin.*—The market opened a fortnight ago at $28.50, but subsequently rose to $30.10, 6000 tons being taken by Europeans and 4000 for China, the receipts amounted to as much. Total shipments since January 1, 98,372 piculs to England, 10,089 to the United States, and 1040 to the Continent. *Exchange*—four months, bank, 3/6⅞—*Schmidt, Kustermann & Co.*

The Experiments on Illuminants for Lighthouses.

The Trinity House Committee's report on the experiments made at South Foreland on the relative merits of lighthouse illumination has just been made, and is of great interest. The three experimental lighthouses erected at the South Foreland—one for electricity, one for gas, one for oil—have already been fully described. The effects of the respective lights have been observed, not only by eye, but also by photometric apparatus. The distant effects have been measured chiefly by the Elder Brethren afloat, by officers on board light-vessels in the vicinity and within range of the lights, by merchant officers in passing ships, sometimes by eye and sometimes by instruments. Observations were also taken at huts at measured distances, and at the coast-guard and other stations on land. Tabulated statements and analyses of all these observations are given in the report. One or two examples of the observations will form an epitome of the whole series, and for this end are selected the observations on May 17 and on June 25. On both days there was thick, dense fog, and the three illuminants were tested under different conditions and very trying circumstances. On May 17 the electric light was shown in triform series—that is, three electric of equal power superposed in the lantern; the gas in quadriform series, or four sets of lights superposed, and the oil in triform series, three superpositions in the lantern. The electric light continued throughout to exhibit the strongest and most distinct ray, and remained longest visible. The quadriform gas and the triform oil remained pretty closely on a par, but with a perceptible superiority of the latter on the fog becoming denser. The gas was lost sight of at 1400 feet, the oil at 1700 feet and the electric beam at 1900 feet.

All the above were revolving lights, and the oil lights were the ordinary service six-wick burners. On June 24 the electric light was not shown in triform series, but double power of electric current was sent through one light, thus greatly intensifying its power. Occassionally the current was sent through two lights in biform series. The quadriform gas remained the same as formerly. The fog was very dense, and the electric lights of the permanent lighthouses were not visible. At 700 feet the double-power single electric light was a dim star, barely visible; the quadriform gas (four lights of 88 burners each) was well visible. At 900 feet the observers were doubtful if the electric light was burning; the quadriform gas was indicated by reflection only, as also was the biform sevenring oil light shown on this occasion. At 1000 feet all were invisible, only a dull radiance showing the direction of the lights. At 990 feet the biform electric and triform gas were visible, but at 1005 feet the biform electric was visible, while the triform gas had disappeared. At 1090 feet the biform electric was visible, but the quadriform gas, which had been seen at 1060 feet, had now disappeared. At 1200 feet the electric had, like the rest, entirely disappeared. The single double-power electric light, through an annular lens, disappeared at 1450 feet. The above lights were all revolving.

The general conclusions arrived at by the committee are that, although so powerful an electric light as was shown in the "A" tower has never been exhibited in an actual lighthouse, it is, nevertheless, a proved working light, and will be established permanently at St. Catherine's Point, on the Isle of Wight, which in 1883 was selected for conversion to an electric station. The committee are of opinion that, for the ordinary requirements of the mariner, its lowest power, or a single current one-lens light, is even more than is wanted, but that when in haze, fog and rain its highest powers are put forth the light will be seen at distances never attempted with gas or oil. As one result the committee are agreed that there is no necessity for superposing electric lights, as increase of light can be got by increase of electrical current, and that consequently the merits or demerits of this system should be discussed on this basis—one economical advantage being that the expense is avoided of providing more than one set of lenticular apparatus and the additional lamps and fittings necessary for superposed lights. The cost of the electric station is thus brought below that of a gas station, whose chief value lies in the superposition of lights. With the electric system the lantern is clear and healthy, and there is not the undue heat of gas to affect men and apparatus alike. The experiments have shown the quadriform gaslight to be a little better than the triform oil, but the difference has never been so marked as to make any practical difference to the sailor.

The committee sum up their report with these conclusions: That the electric light as exhibited in the "A" experimental tower at the South Foreland has proved to be the most powerful light under all conditions of weather, and to have the greatest penetrative power in fog.

The Introduction of the Edison Light.

A striking evidence of the ever-increasing popularity of the incandescent light as an illuminant will be found in the following analysis of the business of the Edison Company in this country:

Plants Established for and Owned by Private Users.

	Plants.	Lamps.
Educational institutions, public asylums and hospitals	26	7,173
Hotels, apartment-houses and clubrooms	23	11,035
Theaters and places for amusement	20	14,035
Banks, office buildings, stores, residences, &c	73	28,757
Newspaper and other printing offices	30	6,521
Sugar refineries	11	4,464
Flour mills and grain elevators	26	1,934
Cotton, woolen and textile fabric mills	81	25,898
Pulp and paper mills	30	3,318
Oil refineries, distilleries, dychouses, chemical works and meat-packing houses	29	3,392
Water works, rubber factories and miscellaneous manufacturing establishments	39	5,088
Iron works, car and machine shops	40	7,828
Furniture and piano-forte manufactories and wood-working establishments	15	2,360
Steamships, steamers, yachts, &c	51	8,092
Totals	494	125,293

All these, it should be borne in mind, are owned and operated by the purchasers themselves.

The central lighting stations, operated by the company and devoted wholly to the work of supplying lights to the general public precisely after the manner of gas, are as follows:

	Lamps supplied.
New York, N. Y	13,000
Bellefonte, Pa	1,200
Middletown, Ohio	700
Williamsport, Pa	4,500
Piqua, Ohio	1,200
Newburgh, N. Y	3,000
Tiffin, Ohio	1,200
Fall River, Mass	3,000
Hazleton, Pa	1,200
Lawrence, Mass	4,500
Shamokin, Pa	3,000
Brockton, Mass	3,000
Circleville, Ohio	1,200
Cumberland, Md	1,200
Des Moines, Iowa	2,000
Appleton, Wis	2,000
Harrisburg, Pa	5,000
West Chester, Pa	2,000
Johnstown, Pa	1,200
Tamaqua, Pa	2,000
McKeesport, Pa	2,000
New Brunswick, N. J	2,000
Boone, Iowa	1,000
Wilmington, Del	2,000
Total	51,400

This makes a grand total of 167,000 lamps; or, if the lamps actually placed in isolated plants were taken, instead of merely the dynamo capacity, a grand total of upward of 250,000 Edison lamps is shown to be in actual use in this country alone.

Ductility of Steel Boiler Plates.

The Secretary of the Treasury has issued the following circular to supervising and local inspectors of steam vessels in regard to the ductility of steel boiler plates:

It having been ascertained to the satisfaction of the department that the regulation promulgated in Department Circular No. 29, February 25, 1885, to take effect September 1, requiring a reduction of area of 53 per cent. on all steel boiler plates of 65,000 pounds tensile strength and upward, is an actual prohibition of the manufacture of such plates, said regulation is hereby modified so as to require a reduction of area as follows:

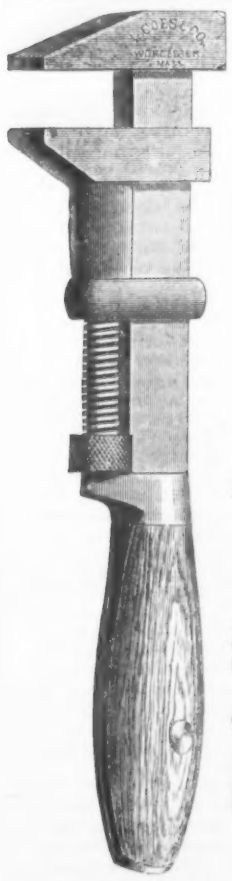
Tensile strength of 70,000 pounds, 43 per cent. reduction of area.

Tensile strength of 65,000 pounds, 50 per cent. reduction of area.

Tensile strength of 60,000 pounds and under, 55 per cent. reduction of area.

This regulation will remain in force unless otherwise ordered at the close of the next annual meeting of the Board of Supervising Inspectors.

The Board of State Equalization fixed the the equalized value of the real and personal property in New York County at $1,413,415,020, which is $112,148,890 more than the assessed value. In Kings County they fixed the equalized value at $309,238,510, which is $13,482,506 less than the assessed value.



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Registered March 31, 1874.

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Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

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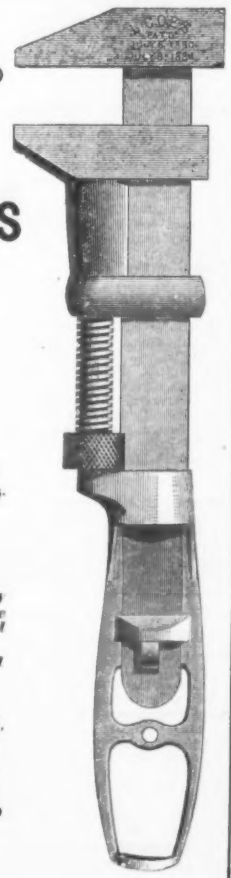

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BUILDERS' FINE HARDWARE,

RIM AND MORTISE DOOR LOCKS WITH

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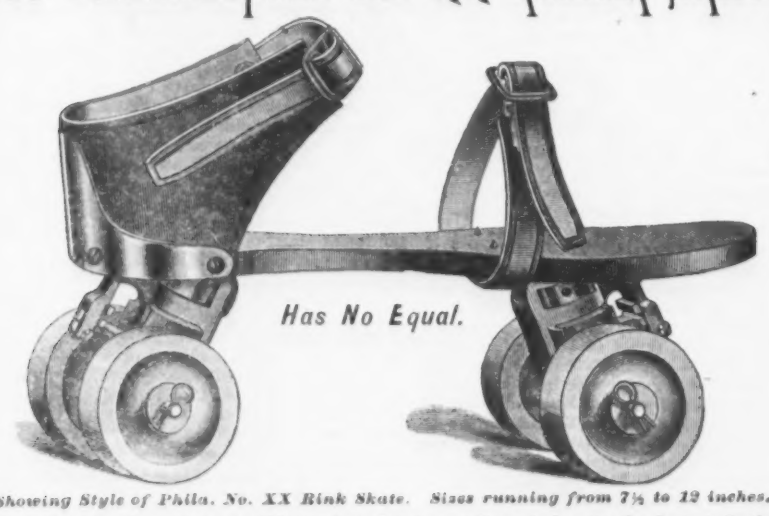

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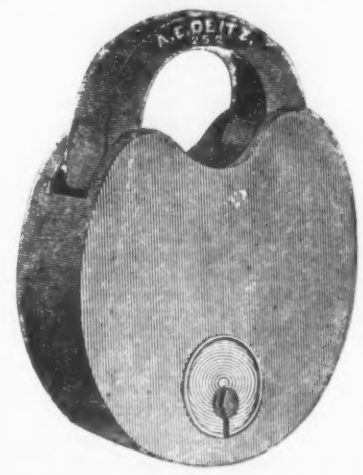

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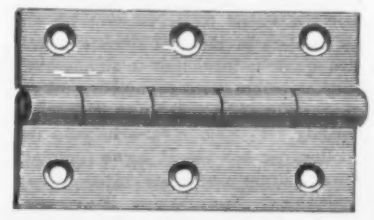

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THE LEVIATHAN

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Made to any Length, Width and Strength.

Main Driving Belts.

Guaranteed to Run Straight, Even Throughout.

No Cross Joints, Unaffected by Damp. Clings well to the Pulley. Has no equal. In fact, is THE BELT.

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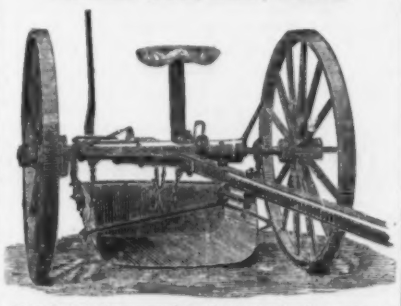

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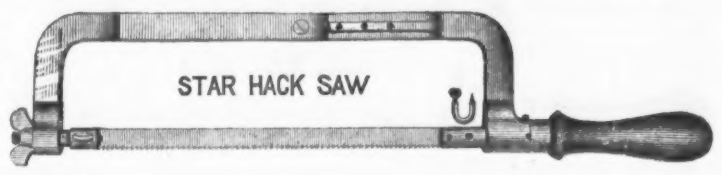

These STAR HACK SAWS are the only thing in our list for which the demand is steadily and rapidly increasing in these dull times. Every dealer who orders them is sure to increase the number in his second order. They will be in universal demand, and every store in the land can sell them at a profit, besides giving great satisfaction to their customers.

There is no risk in handling them, as we will take back every one which is not wanted, whether bought of us or some other dealer. We guarantee them to do double as much cutting as any other kind in market.

Length of Blade,	6,	7,	8,	9,	10,	11,	12,	assorted, 6 to 9.
Price per dozen,	55,	60,	65,	70,	85,	95,	105,	65 cents.

STAR HACK ★ SAW FRAMES.

WITHOUT BLADES.

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No. 0 extension frame, to hold 10, 11 and 12 inch, steel polished and nickeled	$12.00
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No. 2 solid frame, to hold 8 inch, steel polished and nickeled	8 40

As seen in the cut, these frames are all made adjustable, so as to face the blades in four different directions. They also have the patent staple-shaped pins to hold the blades in the frames, which are so arranged that they cannot fall out.

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MECHANICAL.

Sulphur a Cause of Corrosion in Boilers.

Mr. W. M. Barr, in his book on "The Combustion of Coal," records an interesting case where a French commission on the inspection of boilers and the investigation of accidents resulting from their explosion, had its attention drawn to the explosion of two boilers, one at a colliery in Nievre, and the other at the Ougrée Iron Works, in Belgium, in both of which cases the accident was attributed to the destructive effect on the metal of sulphuric acid. This, it was thought, was left by the smoke on certain parts of the sides of the boilers, and the results of an investigation were awaited with considerable interest. It was found that in both cases the iron at the parts which gave way first had been appreciably reduced in thickness, the corrosion being all on the exterior. In the case of the boiler at Nievre it extended over the upper end on the side not exposed, and the trouble was attributed to the corrosive action of oxygen and sulphurous acid contained in the products of combustion in the presence of water coming from a fissure in the boiler above. This, having traversed the brick vaulting, fell on the reheater, wetting the upper part, which was relatively cold, being situated at the extremity of the circuit of smoke, and close to the point where the feed-water arrived. It was remarked that the water vapor contained in the smoke was liable to condense here, and that the effect of this condensation might be added to that of the infiltration and favor the oxidation of the sulphurous acid into sulphuric acid. Large scales of oxide of iron and also sulphur in some form of combination were found on the corroded parts.

The accident at the Ougrée Works presented more conclusive evidence. In this case sulphuric acid was actually found in a free state as well as in the form of sulphate of iron. The boiler was horizontal and cylindrical, with two water tubes below, and was heated from the puddling furnaces. One of the tubes was torn open, the fracture taking two courses perpendicularly, one in the iron plate itself, the other along a riveted seam. The thickness of the iron was reduced to about $\frac{1}{22}$ inch at the edges of the first rent. Two samples of the soot left by the smoke in the parts destroyed were analyzed. They gave sulphate of iron between 52 and 53 per cent., and free sulphuric acid in one sample 1.42 and in another nearly 12 per cent. Soot from other parts also contained sulphuric acid, but not enough to have any sensible result on the iron. The action was thus explained: The soot was deposited during the working of the puddling furnaces in an entirely dry state, but when the fires were put out the air, loaded with moisture, entered and converted the soot into a paste. The oxidation of the sulphurous acid then occurred, and the iron was in the best condition to be attacked. The corrosive action was thus going on constantly when the boiler was not at work and in parts that could not be cleaned out, while no action occurred where the soot had been cleared away.

The Action of Springs.

Our contemporary, the *National Car Builder*, a short time ago directed attention to the fact that a new form of machine for testing car springs, different from any that are in common use, is greatly in demand. Car springs are usually tested by placing on them the weight that they are expected to carry, and then ascertaining how rapidly they will vibrate under such weight. As the load in testing usually consists of disks of iron suspended at the end of a long lever, so adjusted as to throw the desired weight upon the spring, the motion is necessarily slow. In some cases it has been estimated that the spring opens and closes at the rate of only one vibration per second. This is undoubtedly true in respect to rythmic vibration produced by gravity. With less than the total load the speed of opening and closing seems to be almost unlimited. Whenever a wheel passes over a low point in the track the axle is forced—or, more properly, shot—down with a velocity which bears a certain ratio to the reduced resistance which the spring meets at that moment. The reaction which follows is equal, and in the opposite direction. In forcing a wheel down, the only resistance encountered is due to the inertia of the mass below the spring and the friction of the moving parts. That steel springs have a limiting speed of motion is evident from the fact that they transmit jar or tremor perfectly to the car body. Against this they seem to be altogether powerless.

Common observation is sufficient to determine the time needed for a spring to vibrate under its full load. The more important question is, With what speed does the spring open when it is suddenly relieved from half its load? Stated in another form, the problem is to find how fast the spring will open when a wheel drops into a hollow in the track. The rate of this motion is evidently very different from that with which it moves under a full load. The new form of spring-testing machine which is needed should simulate the character of the shocks to which the spring is practically subjected, and make an autographic record both of the intensity of the shock and the time and amplitude of the vibrations resulting from it. The only difficulty will be the inconvenience of handling the weights, which should be placed directly on the spring without the intervention of levers. The friction of the bearings is considerable in spite of the knife-edges, and the spring does not behave as it would with a load directly applied.

The Shipman Engine.

Among the many engines brought out within the past few years, all claiming special advantages as motors for domestic purposes and other uses where compactness, cleanliness and convenience are desirable features, the Shipman Engine, of which we present illustrations on this page, is entitled to attention. It is the invention of Mr. A. H. Shipman, of Rochester, N. Y., and is built by the Shipman Engine Mfg. Co., of that city. Although in many respects of novel construction, its successful practical application in various directions has raised it beyond the experimental stage, and its value is meeting with extending appreciation. Our engravings give a very good idea of the general appearance and arrangement of the engine, Fig. 2 representing a longitudinal section, from which, among other things, the construction of the boiler will readily be understood. This view relates to an earlier form of the engine, in which the cylinder, as shown, was completely covered by an iron casing. This detracts nothing, however, from the value of the cut for our purpose. The fuel used under the boiler is kerosene, which, by means of a steam jet, is introduced into the fire-box in the form of spray. This necessitates the use of an atomizer, and the combustion of the fuel is claimed to be so perfect that there is little or no smoke, and the full value of the heating qualities of the fuel is obtained. On the pipe furnishing steam for the atomizer is a diaphragm which may be set to carry any desired pressure in the boiler, automatically controlling the fire so that increase or decrease above or below a certain limit will extinguish or relight the fire, as the case may be. The oil tank holds about 2 gallons. This tank has a space between the oil and the fire-box, and this space is filled with water from the feed-water supply. This water is then pumped into the boiler. In this way there is a constantly changing jacket of water ¼ inch thick in front of the fire-box, thus making it impossible to heat it. The water supply also is automatic. The boiler is sectional, with tubes screwed into the back. Each tube is tested before use to 400 pounds pressure to the square inch, and the boiler, when completed, is also tested to the same pressure. The pump is made of brass, in regular engine-pump form, with lift and force valves. The plunger is connected to the main shaft by an eccentric, and constantly working when the engine is in motion, and, in connection with the water regulator, keeps a uniform supply of water in the boiler. An automatic governor on the shaft maintains a uniform speed of the engine with a varying load. The cylinders are lubricated with a self oiler. The shafts have oil cups, and the connecting-rods are automatically oiled. The piston has packing rings, and all parts are provided with means of adjustment for wear.

Since this engine was first built experience, constant study, effort and test have greatly added to its strength and durability. The changes which were made consist of about one-half increase of boiler, bearing surfaces doubled, the wrist-pin end of pitman bushed with compressed Babbitt and made interchangeable. The wrist-pins are of hardened steel. A coil-pipe heater was added, lessening water into the boiler at an increased temperature of 180° or more, causing a saving of oil consumption, and assisting by so much in an easy maintenance of steam pressure.

The automatic regulation of fire, water and speed is a feature whose convenience and importance are clearly apparent. Briefly summing up the advantages of the engine, it is seen that it requires no engineer; it is free from explosion; it requires a minimum of attention, and consumes only the amount of fuel required for the power developed, and, when the engine stops, expense stops, as it puts out the fire and lights it again when necessary. The boat engine built by the manufacturers is substantially the same as the one first described, a link motion, however, being substituted for the shaft governor. The engines are made in 1 and 2 horse-power sizes, the former having a 2 x 3 inch cylinder, and making 500 revolutions per minute. The extreme floor space measures 42 x 32 inches; hight over all, 33 inches; weight, about 350 pounds. The 2-horse-power engine has a 3 x 4 inch cylinder, and makes 400 revolutions per minute; extreme floor space, 52 x 32 inches; hight, 44 inches; weight, about 750 pounds.

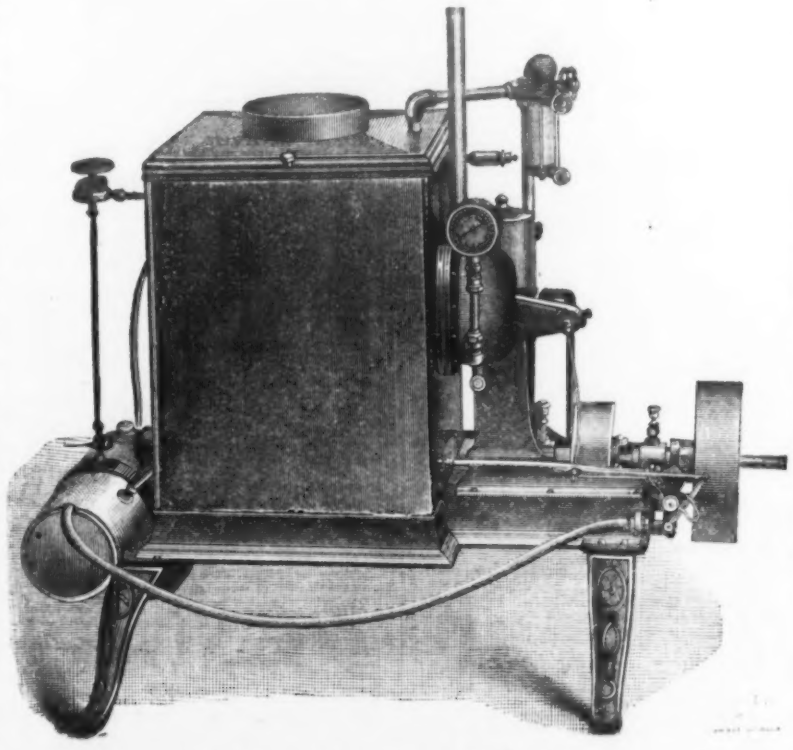


Fig. 1.—General View of Two-H. P. Engine.

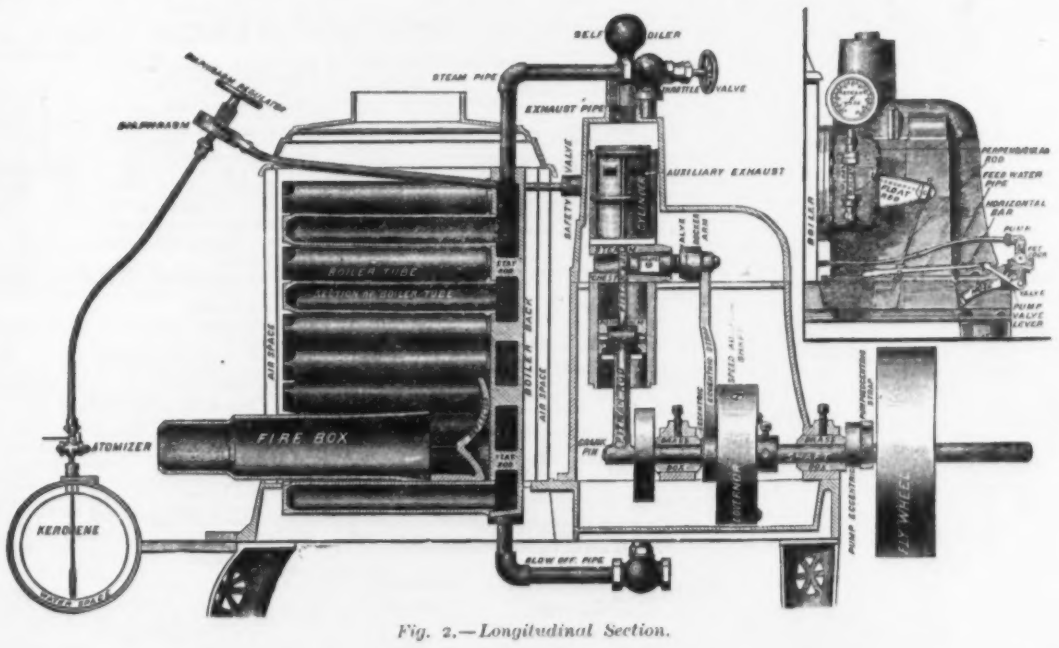


Fig. 2.—Longitudinal Section.

THE SHIPMAN ENGINE, BUILT BY THE SHIPMAN ENGINE MFG. CO., ROCHESTER, N. Y.

The automatic governor on the shaft maintains a uniform speed of the engine with a varying load. The cylinders are lubricated with a self oiler. The shafts have oil cups, and the connecting-rods are automatically oiled. The piston has packing rings, and all parts are provided with means of adjustment for wear.

Since this engine was first built experience, constant study, effort and test have greatly added to its strength and durability. The changes which were made consist of about one-half increase of boiler, bearing surfaces doubled, the wrist-pin end of pitman bushed with compressed Babbitt and made interchangeable. The wrist-pins are of hardened steel. A coil-pipe heater was added, doubly unfortunate, as they not only lay out a much larger amount of money than is really necessary, to begin with, but pay more money continually in running the engines afterward. A sufficiency of power is, of course, the first consideration, but it cannot be too widely known among those interested in the economical use of steam that, wherever the load to be driven by an engine is tolerably constant, there is one size of engine, and one only, which will give the best result. For every engine also there is one definite load, whether the engine be condensing, non-condensing or compound, which will give a maximum of economy in working. Any deviation from this in either direction, either by underloading or overloading, will result in a greater consumption of steam, and consequently of fuel.

The Senderling Lubricating Devices.

The Jersey City Wheel Foundry and Machine Works, of Jersey City, N. J., are now turning out a number of Lubricating Devices for loose pulleys, car and wagon wheels, &c., designed by Mr. M. L. Senderling. Of these we present herewith several illustrations showing sections through the principal parts. It should be remarked that Mr. Senderling's devices are practically divided into two distinct classes—those acting by simple downward flow of oil, and those in which centrifugal force is brought into play. Fig. 1 relates to the second form of apparatus, showing an oiling arrangement for a loose pulley. The bore of the hub B, as will be seen, is made large enough to permit of the introduction of a sleeve or bushing, D, which is firmly fixed on the shaft A by a set-screw J. The pulley, instead of directly bearing on the shaft, thus turns on this bushing, and the hub B is closed at its ends by flanged caps C C. Inner flanges with which these caps are provided form the annular oil chambers G G, which contain some form of fibrous material to act as wipers for the oil tending to escape along the shaft. The outer flanges of the caps closely approach the shaft and taper inward. The sleeve D has inwardly-projecting ribs, and is bored to fit the shaft, leaving, however, an oil space, E E, from which the oil may pass through a number of holes, as shown, so as to reach the wearing surfaces. This oil space communicates with the end or cap chambers by means of grooves (F), which are better shown in Fig. 3. H H are oil-pipes projecting inward and just clear of the shaft, serving for the introduction of oil. The courses for the oil through the ribs of the sleeve D are marked I I in Fig. 2. As regards the action of this device, explanation is almost unnecessary. It will be readily understood that as the shaft, together with the sleeve D, revolves, centrifugal force will cause the oil in the chamber E E to pass through the different holes in the sleeve and spread along the bearing surfaces. This arrangement is specially adapted for high speeds. Fig. 3 explains itself, showing sections through different points in the cap C.

The other device, in which a downward flow of oil is secured, is shownin Fig. 4 as applied to a wagon-wheel. We have here an axle, A, similar to the ordinary form, except as regards a groove in the upper part. The axle-box B B B has a chambered end portion forming oil spaces J K M and I. C is a wooden hub secured in the ordinary manner, and D is the axle nut; E is a sealing nut to prevent escape of oil at the outer end; F is the usual metal hub band with the spoke mortises G. The projections H serve to lift the oil and direct its flow into the openings I. The channels J J permit the return of the oil escaping from the bore of the box to the main chamber, one or more being always below the overflow line; K is the overflow chamber. The grooves L prevent the oil from running along the axle or collar and escaping in this way, and the projecting lips N N serve a similar purpose so far as the walls of the overflow chamber are concerned. The arrangement adopted is exceedingly simple in both devices, which have given highly satisfactory results in all cases. The principle underlying the attachment for lubricating car-wheels is practically the same as that just described, and differs from it mainly in some of the details.

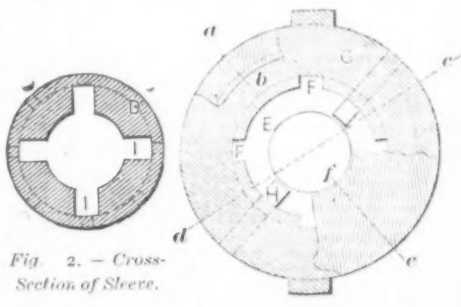


Fig. 2.—Cross-Section of Sleeve.

Fig. 3.—Cross-Sections at Different Points of Cap C, Fig. 1.

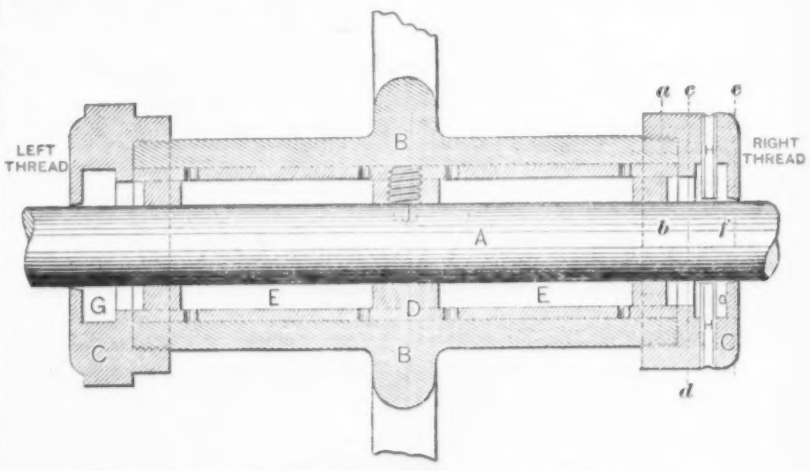


Fig. 1.—Longitudinal Section of Lubricating Device for Loose Pulleys.

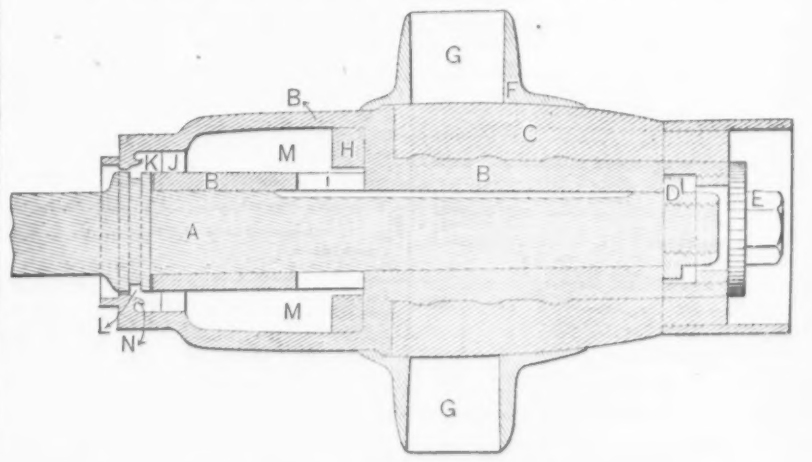


Fig. 4.—Section of Device for Wagon-Wheels.

THE SENDERLING LUBRICATING DEVICES.

Testing Lubricants.

It is a matter no doubt often overlooked in testing lubricants that experiments made upon the nicely fitted journal of a testing machine are not conclusive as to the fitness of a lubricant for use on a similar journal which is not well fitted. As the latter bears only in spots or along lines of contact, it is subjected on such surfaces of contact to pressures which may be enormously heavier than that affecting the same journal when wear or refitting has given it a good bearing. Could its magnitude be known, a good testing machine would determine which of any collection of oils is the best fitted for use upon it. The testing machine determines the behavior of an oil upon its own journals, and only if those on which the lubricant is to be used are similar will its behavior be the same. While the machine does not usually serve to select oils for badly-made lubricated surfaces, it exhibits the intrinsic qualities of the oils tested, and every mechanic and engineer endeavors to get all journals into as good condition as those of the testing machine, and thus fit them to do good work with good oils.

A 5-Man Power Gas Engine.

A small vertical gas engine of the Otto type, rated at 5-man power, is the latest addition to the list of small motors now in the market. It occupies only about 3 feet square of floor space, and is 5 feet 8 inches high, so that those who have little room to spare can fit it into almost any corner. Being so small, the gas consumption is necessarily greater than in the larger engines, but a redeeming feature is found in a sensitive governor with which the engine is furnished, and by means of which automatic regulation of the gas supply is secured. This is a decided departure from the plan usually followed in the construction of small gas engines, and offers advantages which users will not be slow to recognize.

An interesting feature of the exhibition of the American Institute, now in progress, is the exhibit of Beaudry & Cunningham, on the east side of Machinery Hall. In a completely-appointed shop they have three of their latest pattern upright power hammers, which are kept at work on the production of cutlery and other forgings. Besides their hammers, they have all the apparatus of the workshop, including forges, furnaces, anvils, &c. The Beaudry & Cunningham hammers are especially adapted for accurate and fine work, having a vertical movement which insures a square and true blow upon the anvil. They work with great speed and efficiency, and at the fair they attract much attention both from mechanics and the general public.

Current Hardware Prices, October 7, 1885.

HARDWARE.

Anvils.
Eagle Anvils ... ℘ ℔ 10¢—dis 20 %
Wright's ... 9¾ @ 10¢
Armitage's Mouse Hole ... 9¢
Armitage Mouse Hole, Extra ... 11½¢
Trenton ... 9½¢
Wilkinson's ... 9½¢@10¢
J. & Riley Carr, Patent Solid ... 11@11½¢
Anvil Vise and Drill—
Millers Falls Co., $18.00 ... dis 20 %
Cheney Anvil and Vise ... dis 25 %
Allen Combined Anvil and Vise, $2.50 ... dis 40 %
Richardson's Vise and Anvil ... dis 25 %

Augers and Bits.
Douglass Mfg. Co. ... dis 70 %
Other first Quality ... dis 60&10 @ 60&10&5 %
Snell's ... dis 60@60&7½ %
Cook's, Douglass Mfg. Co. ... dis 55 %
Cook's, New Haven Copper Co. ... dis 50&10@50&10&5 %
Ives' Circular Lip ... dis 60 %
Patent Solid Head ... dis 30 %
C. E. Jennings & Co., No. 5 ... dis 40&10 %
C. E. Jennings & Co., No. 30 ... dis 60&10 %
C. E. Jennings & Co., Auger Bits, in fancy boxes. ℘ set, 32½ quarters, No. 5, $5; No. 30, $3 ... dis 20 %
Lewis' Patent Single Twist ... dis 45 %
Russell Jennings' Augers and Bits ... dis 25 %
Imitation Jennings Bits (new list) ... dis 50&10@50&10&5 %
Car Bits, Snell Mfg. Co. ... dis 40&10&10 %
Car Bits, New Haven Copper Co. ... dis 50&10 %
L'Hommedieu Car Bits ... dis 15 %
Snell Mfg. Co.'s Jennings' Bits (new list) ... dis 50&5 %
Expansive Bits—
Clark's small, $18; large, $26 ... dis 33⅓@35&5 %
Ives' No. 4, per doz., $60 ... dis 35@35&5 %
Swan's ... dis 40 %
Ansonia ... dis 25 %
Steer's, No. 1, $26; No. 2, $22 ... dis 35 %
Hollow Augers—
Ives' / French, Swift & Co. / Douglass' ... dis 25&10 %
Bonney's Adjustable ℘ doz. $48 ... dis 40&10 %
Stearns' Adjustable ℘ doz. $48 ... dis 20&10 %
Ives' Expansive, each $4.50 ... dis 45 @ 50 %
Universal Expansive, each $4.50 ... dis 20 %
Wood's ... dis 25 %
Gimlet Bits—
Common ... ℘ gross $3.00 @ $3.25
Diamond ... ℘ doz. $1.10, dis 25&10 %
"Bee" ... dis 25 %
Double Cut, Shepardson's ... dis 45 %
Double Cut, Ct. Valley Mfg. Co. ... dis 30&10 %
Double Cut, Hartwell's, ℘ gro, $6.50 ... dis 10 %
Double Cut, Douglass' ... dis 40 %
Double Cut, Ives' ... dis 50&10 %
Drill Bits—
Syracuse Twist ... dis 30 @ 30&5 %
Holt's Bit Stock Drills ... dis 25&10 %
Ship Augers and Bits—
L'Hommedieu's ... dis 15 @ 20 %
Watrous's ... dis 15 @ 20 %
Snell's ... dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits ... dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule ... $3.50 ℘ gross—dis 40&10 %
Patent Sewing, Short ... $1.00 ℘ doz—dis 40&10 %
Patent Sewing, Long ... $1.20 ℘ doz.—net
Patent Peg, Plain Top ... $10.00 ℘ gross—dis 40&10&5 %
Patent Peg, Leather Top ... $12.00 ℘ gross—dis 40&10&5 %

Awls, Brad Sets, &c.
Awls, Sewing, Common ... ℘ gross $1.70—dis 35 %
Awls, Shouldered Peg ... ℘ gross $2.45—dis 40 %
Awls, Patent Peg ... ℘ gross 63¢—dis 40 %
Awls, Shouldered Brad ... $2.70 ℘ gross—dis 35 %
Awls, Handled Brad ... $7.50 ℘ gross—dis 45 %
Awls, Handled Scratch ... $7.50 ℘ gross—dis 35&10 %
Awls, Socket Scratch ... $1.50 ℘ doz—dis 25 @ 30 %

Awls and Tools.
Aiken's Sets, Awls & Tools ... ℘ doz. $10.00—dis 50&10 %
Millers Falls Adj. Tool Handles ... ℘ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 1 ... ℘ doz $12—dis 25 %
Fray's Adj. Tool Handles, No. 2 ... ℘ doz $18—dis 25 %
Brad Sets, No. 42, $10.50; No. 43, $12.50 ... dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. / Brad Sets, Stanley's Excelsior, No. 2, $4.00. / Brad Sets, Stanley's Excelsior, No. 3, $5.50. ... dis 25&10 %

Axes.
Best according to brand ... ℘ doz $6.25 @ $7
Good Seconds ... $5.50 @ $6

Axle Grease.
Frazer's, in bulk ... Keg ℘ ℔, 5¢; Pail, ℘ ℔, 6¢ net
Frazer's, in boxes ... ℘ gross $10.00 net

Axles.
Nos. 1 to 6 ... dis 60 %
Nos. 7 to 18 ... dis 60&10 %
Nos. 19 to 22 ... dis 70&10 %
Nos. 23 to 26 ... dis 60&10 %
Tubular Wrought Steel (National Self-Oiling):
Less than 10 sets ... dis 33⅓ %
Over 10 sets ... dis 33⅓&5 %

Bag Holders.
Sprengle's Pat., ℘ doz $18 ... dis 60 %

Balances.
Spring Balances ... dis 40&10 %
Common 24 ℔ ... ℘ doz., $1.50—dis 40&10 @ 50 %

Bells.
Hand—
Light Brass ... dis 75&10 @ 80 %
Extra Heavy ... dis 65 @ 65&10 %
White Metal ... dis 70 %
Silver Chime ... dis 25&10&5 %
Globe (Cone's Patent) ... dis 25&10 %
Door—
Gong, Abbe's ... dis 25&10 %
Gong, Yankee ... dis 40&10 %
Gong, Barton's ... dis 40&10 %
Crank, Taylor's ... dis 25&10 %
Crank, Brooks' ... dis 50&10&2 %
Crank, Cone's ... dis 10 %
Crank, Connel's ... dis 20&10 %
Lever, Sargent's ... dis 60&10&10 %
Lever, Taylor's Bronzed or Plated ... net
Lever, Taylor's Japanned ... dis 25&10 %
Lever, R. & M. Co.'s ... dis 50&10&2 %
Pull, Brook's ... dis 50&10&2 %
Pull, Western ... dis 25&10 %
Cow—
Common Wrought ... dis 60&10 @ 60&10&5 %
Western ... dis 20&10 %
Western, Sargent's list ... dis 70&10 %
Kentucky "Star" ... dis 20&10 %
Kentucky, Sargent's list ... dis 70&10 %
Dodge, Genuine Kentucky, new list ... dis 70 %

Nos.	0	1	1½	2	3	4	5	6	7	Hog
	$12.00	10.00	9.00	8.00	6 00	5.00	4.00	3.00	2.50	5.00

Texas Star ... dis 50@50&5 %
Call ... dis 40@40&5 %
Farm Bells ... ℘ ℔, 3½¢
Steel Alloy Church and School Bells ... dis 40 %

Bellows.
Blacksmiths' ... dis 50&10@50&10&5 %
Molders' ... dis 50@50&5 %
Hand Bellows ... dis 50@50&5 %

Belting, Rubber.
Standard ... dis 70 %
Extra ... dis 60@60&10 %
N. Y. Belting & Packing Co., Standard ... dis 60 %
N. Y. Belting & P'k'g Co., Extra Standard ... dis 50&10 %
Cleveland Rubber Co., Extra Standard ... dis 60&10 %
(all above) dis 5 % cash.

Bench Stops.
Hotchkiss's ... ℘ doz $5.00—dis 10 %
Weston's, per doz No. 1, $10; No. 2, $9 ... dis 25&10&5 %
McGill's ... ℘ doz $3—dis 10 %
Morrill's ... ℘ doz $7.50—dis 40&5@40&10 %

Bit Holders.
Extension, Barber's ... ℘ doz $15.00—dis 40&5 %
Extension, Ives' ... ℘ doz $20.00—dis 40&10 @ 40&10&5 %
Diagonal ... ℘ doz $24.00—dis 40 %
Angular ... ℘ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic ... ℘ per doz $3.00—dis 30 %
Excelsior ... ℘ doz $10.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's ... ℘ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern ... $15 ℘ gro.—dis 50&10 %
Van Sand's Old Pattern ... $15 ℘ gro.—dis 50&10 %
Washburn's Old Pattern ... $9 ℘ gro. net
Merriman's ... new list, net
Salisbury & Austin No. 2008 ... $9 ℘ gro. net
Security Gravity ... $9 ℘ gro. net

Blind Staples.
Barbed, ½ in. and larger ... ℘ ℔ 8 @ 8½¢ net
Barbed, ⅜ in ... ℘ ℔ 9 @ 9½¢ net

Blocks.
Tackle Blocks, &c. list April 17, 1885 ... dis 20 %
Reed Mfg. Co. Self-Lubricating ... dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c. ... dis 70 @ 70&5 %
Cast Iron Shutter Bolts ... dis 70 @ 70&5 %
Cast Iron Chain (Sargent's list) ... dis 70 @ 70&5 %
Ives' Patent Door Bolts ... dis 55&10 %
Wrought Barrel ... dis 70 @ 70&5 %
Wrought Square ... dis 70 @ 70&5 %
Wr't Shutter, all Iron, Stanley's list ... dis 50&10&10&5 %
Wr't Shutter, Brass Knob, Stanley's ... dis 25&10&10&5 %
Wrought Shutter, Sargent's list ... dis 60&10&5 %
Wrought Sunk Flush, Sargent's list ... dis 60&10&5 %
Wrought Sunk Flush, Stanley's list ... dis 40&10&5 %
Wrought B. K. Flush, Com'n Stanley's list ... dis 55 %
Carriage—
Com. list June 10, '84 ... dis 80 @ 80&5 %
Genuine Eagle, list Oct., '84 ... dis 75&5@75&10 %
Phila. pattern, list Oct. 7, '84 ... dis 75&10@80 %
R. B. & W., old list ... dis 70&5 %
Tire—
Common, list Feb. 28, 1883 ... dis 70&5 @ 70&10 %
Am. S. Co., Norway, Ph'l., list Oct. 16, '84 ... dis 82½ %
Am. S. Co., Eagle, Phil. list Oct. 16, '84 ... dis 82½&5 %
Am. S. Co., Bay State, list Feb. 28, '83 ... dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884 ... dis 80&5 %

Stove and Plow—
Stove ... dis 70 %
Plow ... dis 65 %
R. B. & W., Plow ... dis 50&5 %
R. B. & W., Stove ... dis 70&5 %
Machine ... dis 80 %
Bolt Ends ... dis 80 %

Borax ... ℘ ℔ 8½¢ @ 9¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75 ... dis 50 %
Snell's, Rice's Patent	5.50	6.75 dis 40&10&10 %
Jennings	5.50	6.75 dis 45@45&10 %
Other Machines	2.50	3.00 ... net
Phillips' Pat., with Augers	7.00	7.50 ... net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2— dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos. ... dis 70 @ 70&10 %
Sargent & Co.'s ... $17 and $18, dis 60&10 %
Peck, Stow & W. Co. ... dis 50&10 @ 50&10&5 %

Braces.
Q. S. Backus ... dis 50&10 @ 50&10&10 %
Barber's, Nos. 10 to 16 ... dis 50 %
Barber's, Nos. 30 to 33 ... dis 50 %
Barber's, Nos. 40 to 63 ... dis 50&10 %
Spofford's ... dis 50&10 @ 50&10&10 %
Ives' Patent Braces ... dis 60@60&5 %
Common Ball, American ... dis 55&10 %
Bartholomew's, Nos. 25, 27, 30 ... dis 50&5 @ 50&10&5 %
Bartholomew's, Nos. 117, 118, 119 ... dis 65 %
Amidon's Barker's Imp'd ... dis 60@60&10&5 %
Amidon's Corner Brace ... dis 40 @ 40&5 %
Universal ... 8 in., $1.90; 10 in., $2.10
Buffalo Ball ... 8 in., $1.50 @ $1.55

Brackets.
Shelf, plain, Sargent's list ... dis 60&10 %
Shelf, fancy, Sargent's list ... dis 60&10&10 %
Reading, plain ... dis 60&10&5 %
Reading, Rosette ... dis 66⅔&10 %

Bright Wire Goods.
Manufacturers' price ... dis 70&5&10 %, cash

Broilers.

		9	10	9 x 11
Henis' Self-Basting	Inch	9	10	9 x 11
	Per doz	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.
Union Nut Co. ... dis 55 %
Sargent's ... dis 66⅔&10 %
Hotchkiss' low list ... dis 30 %
Humason, Beckley & Co.'s ... dis 70&10 %
Peck, Stow & W. Co.'s ... dis 50&10 %
Ellrich Hdw. Co., White Metal, low list ... dis 50 %

Butts.
Brass—
Wrought Brass ... Association price, dis 70 %
Cast Brass, Tiebout's ... dis 40 %
Cast Brass, Corbin's F. Joint ... dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint ... dis 33⅓&10@33⅓&10&10 %
Cast Iron—
Fast Joint, Narrow ... dis 60&10@60&10&5 %
Fast Joint, Broad ... dis 60&10@60&10&5 %
Loose Joint / Loose Joint, Japanned / Loose Joint, Jap. with Acorns / Parliament Butts / Mayer's Hinges / Loose Pin, Acorns / Loose Pin, Acorns, Japanned / Loose Pin, Acorns, Jap. Pltd. Tips ... dis 70&10 @ 70&10&10 %
Wrought Iron—
Fast Joint, Narrow ... dis 60&10&10 %
Fast Joint, Lt. Narrow ... dis 60&10&10 %
Fast Joint, Broad ... dis 60&10&10 %
Loose Joint, Broad ... dis 60&10&10&5 %
Table Butts, Back Flaps, &c. ... dis 60&10&10 %
Inside Blind, Regular ... dis 60&10&10 %
Inside Blind, Light ... dis 60&10&10 %
Loose Pin, Wrt ... dis 60&10&10&5 %
Loose Pin, Light ... dis 60&10&10 %
Bronzed Wrought Butts ... dis 45&5@45&10 %
Blind Butts—
Parker ... dis 75&2 %
Palmer ... dis 50&5&10 %
Seymour ... dis 70&2 %
Lull & Porter ... dis 80&10 %
Nicholson ... dis 45&10 %
Huffer ... dis 50
Clark's, Nos. 1, 3, 5 ... dis 80 %
Manhattan Hardware Co. ... dis
Sargent's, Nos. 1, 3 ... dis 75&10 %
Sargent's, No. 12 ... dis 75&10&10 %
Reading's Gravity ... dis 75&10 %
Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55 ... dis 75&10&5 @ 80 %
Shepard's Champion Gravity, No. 75 ... dis 80&10 %
Shepard's "Gravity," Nos. 1, 3 and 5 ... dis 80 @ 80&5 %
North's Automatic Blind Fixtures, No. 2, for Wood, $9; No. 3, for Brick, $10.50.
Shepard's "O. S." and "Acme" Lull & Porter ... dis 75&10&5 %
Shepard's "Queen City" Reversible ... dis 75&10&5 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3 ... d's 70 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co. ... dis 30&5 @ 30&10 %
Bradley's ... dis 25 @ 30 %
Beatty's ... dis 33⅓&5 %

1	2	3	4	5	6	7	8
$16.50	19.00	21.50	24.00	27.00	30.00	33.50	36.50

New Haven Edge Tool Co.'s ... dis 40 %
Albertson Mfg. Co. ... dis 33⅓ @ 33⅓&5 %

Calipers ... See Compasses

Can Openers.
Messenger's Comet ... ℘ doz $3.00, dis 25 %
American ... ℘ gross $3.00
Duplex ... ℘ doz 25¢, dis 15 @ 20 %
Lyman's ... ℘ doz $3.75, dis 20 %
No. 4, French ... ℘ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle ... ℘ gross $6.00, dis 45 @ 50 %
Eureka ... ℘ doz $2.50, dis 10 %
Sardine Scissors ... ℘ doz $7.00, dis 55 %
Star ... ℘ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50 ... dis 50&10&10 %
World's Best, ℘ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00 ... dis 50&10 %
Universal ... ℘ doz $3.00, dis 35&5 %
Domestic ... ℘ doz $2.50, dis 45 %
Champion ... ℘ doz $2.00, dis 50 %

Caps—Percussion, ℘ 1000.
Hicks & Goldmark's
F. L. Waterproof, 1-10's ... 50¢
E. B. Trimmed Edge, 1-10's ... 65¢
E. B. Ground Edge, Central Fire, 1-10's ... 70¢
Double Waterproof, 1-10's ... $1.40
(above) dis 25 @ 25&5 %
Musket Waterproof, 1-10's ... 50¢
G. D. ... 28¢
S. B. ... 30¢
Union Metallic Cartridge Co.
F. C. Trimmed ... 50¢
F. L. Ground ... 65¢
Cen. Fire Ground ... 70¢
Double Waterproof ... $1.40
Double Waterproof, in 1-10's ... 1.40
(above) dis 25 @ 25&5 %
S. B. Genuine Imported ... 45¢
Eley's E. B. ... 56¢
Eley's D Waterproof, Central Fire ... $1.60

Cartridges.
Rim, list Jan. 1, '84 ... dis 60&10&2 @ — %
Central Fire, list Jan. 1, '84 ... dis 40&10&2 @ — %

Cards.
Horse and Curry ... dis 10 %
Cotton ... New list, Aug., 1883, dis 10 %
Wool ... " " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished ... ℘ doz $5.00, dis 30 %
Cast Iron, Steel Points ... ℘ doz $1.00, dis 15 %
Socket ... ℘ doz $2.50, dis 25 %
Bullard's ... dis 25 %

Carpet Sweepers.
Bissell No. 5 ... ℘ doz $17.00
Bissell No. 7 New Drop Pan ... ℘ doz $19.00
Bissell No. 12 Hall Sweeper ... ℘ doz $42.00
Mystic ... ℘ doz $17.00
Cottage ... ℘ doz $15.00
Garland ... ℘ doz $19.00
Queen ... ℘ doz $16.00
Queen, with band ... ℘ doz $18.00
King ... ℘ doz $30.00

Casters.
Bed / Plate / Shallow Socket ... dis 60&5@60&10 %
Deep Socket ... dis 45 @ 50 %
Yale Casters, reduced list May, 1884 ... dis 25@25&10 %
Martin's Patent (Phœnix) ... dis 45&10 @ 50 %
Payson's Anti friction ... dis 60 %
"Giant" Truck Casters ... dis 10 %
Stationary Truck Casters ... dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s ... dis 75 %
Sargent's ... dis 66⅔&10 %
Hotchkiss ... dis 30 %
Peck, Stow & W. Co. ... dis 50&10 %

Chain.
Trace, 6½-10-2 Exact ... ℘ pair 70¢
Trace, 6½-10-3 Exact ... ℘ pair 70¢
Trace, 7-10-2 Exact ... ℘ pair 80¢
(above) dis 50&10 @ 60 %
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884 ... dis 50&10 @ 60 %

American Coil	3-16	¼	5-16	⅜	7-16	½
	$0.8	.06	.05¼	.04¾	.04½	.04¼

German Coil, list of June, 1881 ... dis 55&5 %
German Halter Chain, list of June, 1884 ... dis 55&5 %
Covert Halter, Hitching and Breast ... dis 50&2 %
Covert Traces ... dis 35&2 %
Meneely's Breast, Halter and Hitching ... dis 50&10 %
Meneely's Pat. Sleeve-Snap Breast ... dis 50&10
Oneida Halter Chain (old list) ... dis 45 %
Galvanized Pump Chain ... ℘ ℔ 5½¢ @ 6¢
Jack Chain, Iron ... dis 75 @ 75&5 %
Jack Chain, Brass ... dis 70&10 @ 70&10&5 %

Chalk.
White ... ℘ gro 55¢
Red ... ℘ gro 75¢
Blue ... ℘ gro 90¢
White Crayons ... ℘ gro 12¢ @ 13¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer ... dis 80 %
Douglass & Witherby ... dis 75 @ 75&5 %
Socket Framing and Firmer, Buck Bros. ... dis 30 %
Socket Framing and Firmer, Merrill ... dis 60&10&10 %
Socket Firmer, Framing, &c., L. & I. J. White ... dis 25&5 %
Socket Framing Firmer &c., Crossman ... dis 65&5 %
Tanged Firmers ... dis 50 @ 50&5 %
Tanged Firmers, Butcher's ... $4.75 @ $5.00
Tanged Firmers, Spear & Jackson's ... $5.00 to £
Tanged Firmers, Buck Bros. ... dis 30 %

[Cla]mps.
Providence Tool Co.'s Wrought Iron ... dis 25 %
Adjustable, Gray's ... dis 20 %
Adjustable, Lambert's ... dis 20 %
Adjustable, Snow's ... dis 40&5 %
Adjustable, Hammer's ... dis 15 %
Adjustable, Stearns' ... dis 20&10 %
Cabinet Sargent's ... dis 70&10 %
Carriage Makers', Sargent's ... dis 70&10 %
Ebernard Mfg. Co. ... dis 40&5 @ 40&10 %
Warner's ... dis 40&10 %
Saw Clamps ... See Vises

Clips.
Axle and Spring Bar, Norway Iron ... dis 65 %
Wrought-Iron Felloe Clips ... ℘ ℔ 5½¢
Steel Felloe Clips ... ℘ ℔ 5¢

Coal Vases.
Buffalo Palace, S. S. & Co. ... dis 33⅓&10 %
Buffalo Common, S. S. & Co. ... dis 33⅓&10 %

Cockeyes. ... dis 50 %

Cocks, Brass.
Racking ... dis 65&5 %
Globe ... dis 65&5 %
Plain Bibbs ... dis 60&5 %
Ale and Beer ... dis 60&5 %

Coffee Mills.
Board and Box ... dis 40&10&2 @ 45&10&2 %
Selsor's Patent ... $9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co. ... dis 20&10@33⅓ %
The "Swift," Lane Bros ... dis 20&10 %
Webb's Patent ... dis 45 %

Compasses, Dividers, &c.
Compasses ... dis 60&10&10 %
Calipers ... dis 60&10&10 %
Dividers ... dis 60&10&10 %
Bemis & Call Co.'s Dividers ... dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers ... dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside ... dis 50&5 %
Bemis & Call Co.'s Double ... dis 60 %
Bemis & Call Co.'s (Call's Patent Inside) ... dis 30 %
Excelsior ... dis 50 %
Cook's Extension ... dis 25 @ 25&10 %
J. Stevens & Co.'s Calipers and Dividers ... d's 25&10 %

Coopers' Tools.
Bradley's ... dis 20 %
Barton's ... dis 20@20&5 %
L. & I. J. White ... dis 20&5 %
Albertson Mfg. Co. ... dis 25 %
John Beatty & Co ... dis 33⅓ %

Corkscrews.
Humason & Beckley Mfg. Co. ... dis 40 %
Clough's Patent ... dis 33⅓ @ 33⅓&5 %
Howe Pros. & Hulbert ... dis 35 %

Corn Knives and Cutters.
Bradley's ... dis 10 %
Wadsworth's ... dis 25 %

Cradles.
Grain ... dis 40&5&2 %

Crow Bars.
Cast Steel ... ℘ ℔ 3¼@3⅜¢
Iron, Steel Points ... ℘ ℔ 3¼@3⅜¢

Curry Combs.
Fitch's ... dis 50&10 %
Rubber ... ℘ doz $10.00, dis 25 @ 30 %

Curtain Pins.
Silvered Glass ... net
White Enamel ... net

Cutlery.
Beaver Falls and Booth's ... dis 33⅓ %
Goodel Co., Table ... dis 40 %
Wostenholme ... $7.75 @ $8.00 to £

Dividers ... See Compasses

Dog Collars.
Embossed Gilt, Pope & Stevens' list ... dis 30&10 %
Leather, Pope & Stevens' list ... dis 40 %
Brass, Pope & Stevens' list ... dis 40 %

Door Springs.
Torrey's Rod, regular size ... ℘ doz $1.45 @ $1.50
Gray's ... ℘ gro, $20.00, dis 20 %
Bee Rod ... ℘ gro, $20.00, dis 20 %
Warner's No. 1, ℘ doz, $2.50; No. 2, $3.30 ... dis 40&10 %
Gem (Coil):
No. 1, Large Japanned ... ℘ doz $4.00
No. 2, Medium, Japanned ... ℘ doz 2.75
No. 3, Small, Japanned ... ℘ doz 2.00
(above) dis 50&10 %
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ℘ doz $1.50
No. 5, Screen Door size ... ℘ doz 2.00
No. 6, Medium ... ℘ doz 2.75
No. 7, Large ... ℘ doz 4.00
(above) dis 60 %
Victor (Coil) ... dis 50&10&10 %
Champion (Coil) ... dis 50&10 @ 50&10&10 %
Philadelphia ... 5 in., $5.00; 8 in., $7.75, dis 50 %
Cowell's ... No. 1, ℘ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete ... ℘ doz $2.25, dis 20&10 %
Hercules ... dis 50 %
Shaw Door Check and Spring ... dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring ... dis 25 %

Drawing Knives ... dis 80 %
Douglass & Witherby ... dis 75 @ 75&5 %
Merrill ... dis 60&10&10 %
Watrous ... dis 15&10 %
L. & I. J. White ... dis 20&5 %
Bradley's ... dis 35 %
Adjustable Handle ... dis 20 @ 25 %

Drills and Drill Stocks.
Blacksmiths' ... each, $1.00 @ $1.70
Blacksmiths' Self-Feeding ... each, $7.50, dis 20 %
Breast, P. S. & W ... dis 40&10 %
Breast, Wilson's ... dis 30&5 %
Breast, Millers Falls ... each, $3.00 dis 25 %
Breast, Bartholomew's ... each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's ... dis 20 %
Ratchet, Ingersoll's ... dis 25 %
Ratchet, Whitney's ... dis 20&10 %
Ratchet, Weston's ... dis 20@25 %
Ratchet, Moore's Triple Action ... dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable $12.00 ... dis 20&10 %
Wilson's Drill Stocks ... dis 10 %
Automatic Boring Tools ... each, $1.75 @ $1.85

Drill Chucks.
Morse's Beach Patent ... each, $8.00, dis 20 %
Morse's Adjustable ... each, $7.00, dis 20 @ 20&5 %
Danbury ... each, $8.00, dis 30 @ 30&5 %

Dripping Pans.
Buffalo, S. S. & Co. ... ℘ ℔, 5½¢

Egg Beaters.
Dover ... ℘ doz., $2.50
National ... ℘ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.) ... ℘ gro, $17.00@$18.00
Standard ... ℘ gro, $12.00
Kingston ... ℘ gro, $9.00
Acme ... ℘ gro, $8.00
Triumph (T. & S. Mfg. Co.) ... ℘ gro, $10.50@$11.50
Advance No. 1 ... ℘ gro $10.50
Advance, No. 2 ... ℘ gro $10.00
Bryant's ... ℘ doz $2.00, dis 25 %

Emery.
Regular numbers ... ℘ ℔ 7¢
Flour and F. F. ... ℘ ℔ 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron ... dis 50&10 %
Brass ... dis 60 %

Escutcheons.
Door Lock ... Same discounts as Door Locks
Brass Thread ... dis 60 @ 60&10 %
Wood ... dis 25 %

Faucets.
Fenn's ... dis 40 %
Bohren's Patent Rubber Ball ... dis 25 %
Fenn's Cork Stops ... dis 33⅓ %
Star ... dis 60 @ 60&5 %
Frary's Patent Petroleum ... dis 33⅓& 10 %
West's Patent Key ... dis 50 %
Anchor Lock ... dis 45 %
Metallic Key, Leather Lined ... dis 55&10 @ 60&10 %
Cork Lined ... dis 70 @ 70&10 %
J. Sommer's Best Block Tin Key ... dis 40 %
J. Sommer's Cork Lined, 1st quality ... dis 50 %
J. Sommer's Diamond Lock ... dis 40 %
Self-Measuring, Enterprise ... ℘ doz $36.00—dis 20&10 %
Self-Measuring, Lane's ... ℘ doz $36.00—dis 25&10 %
Self-Measuring, Victor ... ℘ doz $36.00—dis 25&10 %

Felloe Plates ... ℘ ℔ 6½¢ net

Files.
Best Domestic, according to brand ... dis 60 @ 60&10&5 %
Lower Grade domestic Files ... dis 60&10&10 @ — %
New Am. File Co., Pat. Tapers ... dis 50 %
J. B. Smith Co. Screw Tang Files ... dis 60 %
J. B. Smith Co. Horse and Wood Rasps ... dis 50&10 %
J. & Riley Carr ... New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps ... dis 10 %
Moss & Gamble ... New list, dis 15 %
Butcher ... New list, dis 20 %
Stubs ... dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls ... $3.25 each / Knox, 6-inch Rolls ... $3.60 each ... dis 35 %
Eagle, 3½-inch Roll ... $2.15, dis 35 %
Eagle, 5½-inch Roll ... 2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in., $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel ... 6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter ... $1.50 each, net
Geneva Hand Fluter, White Metal ... ℘ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ℘ doz ... dis 30 %
Shepard Hand Fluter, No. 85 ... ℘ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110 ... ℘ doz $11, dis 40 %
Shepard Hand Fluter, No. 95 ... ℘ doz $8, dis 40 %
Clark's Hand Fluter ... ℘ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron ... ℘ doz $15.00, dis 30 %
Buffalo ... ℘ doz $10.00, dis 10 %

Fluting Scissors ... dis 45 %

Fly Traps.
Paragon ... ℘ doz $2.00

Forks.
Hay, Manure and Spading ... dis 60&10@60&10&10 %
Plated, see Spoons.

Freezers.—See Ice-Cream Freezers.

Fruit and Jelly Presses.
Enterprise Mfg. Co. ... dis 20&10 @ 33⅓ %

Fry Pans.
Central Stamping Co.'s list ... dis 33⅓&2 @ — %

No	0	1	2	3	4	5	6	7	8
℘ doz	$1.50	1.75	2.00	2.25	2.50	2.75	3.25	3.75	4.25

Sidney Shepard & Co. ... dis 40&2 %
"Acme" ... dis 60 %
Iron Clad Mfg. Co.'s list ... dis 70 %

No	0	1	2	3	4	5	6	7	8
℘ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking ... dis 60&10 %
Wire ... dis 10&10 %
Wire, Wheeler, Madden & Co. ... dis 10 %

Gimlets.
Nail and Spike ... dis 50&10&5 %
"Eureka" Gimlets ... dis 40&10 %
"Diamond" Gimlets ... dis 40&10 %
Double Cut, Shepardson's ... dis 45 %
Double Cut, Ives' ... dis 50 %
Double Cut, Douglass' ... dis 40 %
"Bee" ... ℘ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled ... dis 40&5@40&10 %
Family, Howe's "Eureka" ... dis 40 %
Family, L. F. & C.'s "Handy" ... dis 45 %

Grindstone Fixtures.
Sargent's Patent ... dis 70&10&10 %
Reading Hardware Co ... dis 35&10 %

Gun Wads.
U. M. C. & W. R. A.—B. E., 11 up ... $1.60
U. M. C. & W. R. A.—B. E., 9&10 ... 1.85
U. M. C. & W. R. A.—B. E., 7&8 ... 2.10
U. M. C. & W. R. A.—P. E., 11 up ... 2.50
U. M. C. & W. R. A.—P. E., 9&10 ... 3.20
U. M. C. & W. R. A.—P. E., 7&8 ... 4.00
(above) dis 10 %
Eley's B. E., 11 up ... 1.75
Eley's P. E., 11 @ 20 ... 2.80

Hack Saws.
Griffin's Hack Saws, complete ... dis 40&10 %
Griffin's Hack Saw, Blades only ... dis 40&10 %
Star Hack Saws and Blades ... dis 25 %

Halters.—Covert's Pat. ½ Jute ... dis 50&10 %
Covert's Hemp Horse and Cattle Ties ... dis 50&10 %
Covert's Jute Horse and Cattle Ties ... dis 60 %
Meneely's Pat. Adjustable Hemp and Jute ... dis 50&10 %
Meneely's Hemp and Jute Horse and Cattle Ties ... dis 50&10 %

Hammers.
Maydole's ... dis 15&10 %
Cheney's, new list, March, 1883 ... dis 20&10 %
Hartford Hammer Co.'s Nail Ham's ... dis 25&5@25&10 %
Buffalo Hammer Co. ... dis 30 @ 35 %
C. Hammond & Son ... dis 40&10 %
Humason & Beckley ... dis 25 @ 30 %
Verree ... dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75 ... dis 25&10 %
Nelson Tool Works ... dis 40&10 %
Warner & Nobles ... dis 10 %
Yerkes & Plumb, A. E. Nail ... dis 40&10 %
Wilkinson's Smiths' ... 10½¢ @ 11¢ ℘ ℔
Heavy Hammers and Sledges ... dis 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ℘ doz ... dis 10 %
Providence Tool Co., Leg Irons, $25.00 ℘ doz ... dis 10 %
Tower's ... dis 25 %
Daley's Improved Hand Cuffs; 2 Hands, Polished, ℘ doz, $48; Nickeled, $57; 3 Hands, Polished, ℘ doz, $72; Nickeled, $84 ... dis 20 %

Handles.—Door or Thumb Latches.

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10 %

Roggin's Latches ... ℘ doz. 32¢ @ 37¢ net
Bronze Iron Drop Latches ... ℘ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88 ... net
Barn Door ... ℘ doz. $1.40, dis 10&10 %
Wrought Chest ... dis 70 %
Surface Chest ... dis 70 %
Flush Chest ... dis 70 %
Lifting ... dis 70 %
Handles, Wood—
Saw and Plane ... dis 40&10 %
Hammer and Hatchet ... dis 20 %
Brad Awl ... ℘ gross $2.00
Hickory Firmer Chisel, assorted ... ℘ gross 4.50
Hickory Firmer Chisel, large ... ℘ gross 5.00
Apple Firmer Chisel, assorted ... ℘ gross 5.00
Apple Firmer Chisel, large ... ℘ gross 6.00
Socket Firmer Chisel, assorted ... ℘ gross 3.00
Socket Framing Chisel, assorted ... ℘ gross 5.00
(above) dis 40
J. B. Smith Co.'s Pat. File ... dis 50 %
File, assorted ... ℘ gross 2.75
Auger, assorted ... ℘ gross 5.00
Auger, large ... ℘ gross 7.00
(above) dis 33⅓ @ 40 %
Patent Auger, Ives' ... dis 25 %
Patent Auger, Douglass' ... ℘ set $1.25 net
Patent Auger, Swan's ... ℘ set $1.00 net
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ℘ pair, 30¢; No. 3, 25¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles ... 50¢, dis 60 %
Champion ... 15¢

Hangers.
Barn Door, old patterns ... dis 60&10&10 %
Barn Door, New England ... dis 60&10&10&10 %
Climax (Anti-Friction) ... dis 55 %
Zenith Anti-Friction Wood Track ... dis 55 %
Reed's Steel Arm ... dis 40 %
Challenge ... dis 50 %
"Champion" Medina Mfg Co. ... dis 60 %
Sterling Improved (Anti-Friction) ... dis 65&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18 ... dis 50&2 %
Cheritree ... dis 50&5 %
Kidder's ... dis 50&10 @ 50&15 %
U. S. ... dis 60&10 %
The "Boss" ... dis 60 %
Best Anti-Friction ... dis 60 %
Duplex (Wood Track) ... dis 60 %
Terry's Patent ... ℘ doz. pr., 3½ in., $10; 5 in., $12 ... dis 40&5@40&10 %
Cronk's Patent ... No. 4, $12; No. 5, $14.40; No. 6, $18 ... dis 50&5 @ 50&10 %
Wood Track, Iron Clad ... ℘ ft. 8¢, dis 50&5 @ 50&10 %
Architect ... ℘ set $6.00, dis 20 %
Eclipse ... dis 20&10
Felix ... ℘ set $4.50, dis 20 %
Hamilton Wrought ... dis 50 @ 50&5 %
Richards' (lots of 50 sets dis 20&10&10 %) ... dis 20&10 %
Lane's Steel Anti-Friction ... dis 30&10 %
The Ball Bearing Door Hanger ... dis 20&10 @ 25&10 %
Warner's Patent ... dis 20 %
Stearns' Anti-Friction ... dis 20 %

Harness Snaps.
Anchor (T. & S. Mfg Co.) ... dis 65 %
Henshaw's, list of 1½ changed to $14.00 ... dis 65 %
Judd's, list of 1½ changed to $14.00 ... dis 65 %
Fitch's (Bristol), list of 1½ changed to $14.00 ... dis 65 %
Hotchkiss ... dis 10 %
Andrews ... dis 50 %
Sargent's Patent Guarded ... dis 70&10&10 %
German, old list ... dis 75 %
German, Sargent's new list ... dis 60&10&10 %
Covert ... dis 50 %
Covert, New Patent, new list ... dis 50 %
Covered Spring ... dis 66⅔&10 %
Meneely's Pat. Safety, new list ... dis 60&10 %
Meneely's Pat. Guard, new list ... dis 60&10 %
Meneely's Pat. Chain Link ... dis 60&10 %

Hatchets.
Isaiah Blood ... dis 35 @ 40 %
Shingling, Nos. 1 2 3 ... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ℘ doz 7.50 8.00 8.50
Hunt's ... 40 %
Shingling, Nos. 1 2 3 ... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ℘ doz 7.50 8.25 9.00
Hurd's ... dis 40&5 @ 45 %
Shingling, Nos. 1 2 3 ... ℘ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3 ... ℘ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3 ... ℘ doz 8.00 8.50 9.00
Yerkes & Plumb ... dis 40&10@40&10&5 %
Shingling, Nos. 1 2 3 ... ℘ doz $7.50 $8.00 $8.50
Claw, Nos. 1 2 3 ... ℘ doz 8.00 8.50 9.00
Lathing, Nos. 1 2 3 ... ℘ doz 7.50 8.00 8.50
Underhill Edge Tool Co. ... dis 40 %
Shingling, Nos. 1 2 3 ... ℘ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3 ... ℘ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3 ... ℘ doz 7.50 8.25 9.00
Lathing, Solid Steel ... dis 30 @ 35 %
No. 1, $12. Boston Pattern, $15.
C. Hammond & Son ... dis 40&10 %
Shingling, Nos. 1 2 3 ... ℘ doz $8.00 $8.50 $9.00
Lathing, Nos. 1 2 3 ... ℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 ... ℘ doz 8.50 9.00 9.50
Broad, Nos. 1 2 3 ... ℘ doz 11.00 13.50 16.00
Simmons ... dis 35 @ 40 %
Shingling, Nos. 0 1 2 3 ... ℘ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 0 1 2 3 ... ℘ doz 8.50 9.00 9.50
Lathing, Nos. 0 1 2 3 ... ℘ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4 ... ℘ doz 9.00 10.00 12.00 14.00
Broad, Nos. 5 6 7 8 ... ℘ doz 16.00 18.00 20.00 22.00
Collins ... dis 10 %
Shingling, Nos. 1 2 3 ... ℘ doz $5.50 $6.00 $6.50
Claw, Nos. 1 2 3 ... ℘ doz 6.00 6.50 7.00
Lathing, Nos. 1 2 3 ... ℘ doz 5.50 6.00 6.50
Peck's Champion Blade ... dis 40&10 @ 40&10&5 %
Shingling, Nos. 1 2 3 ... ℘ doz $8.00 $8.50 $9.00
Lathing, Nos. 1 2 3 ... ℘ doz 8.00 8.50 9.00
Claw, Nos. 1 2 3 ... ℘ doz 9.00 9.50 10.00
Half, Nos. 1 2 3 ... ℘ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 ... ℘ doz 10.00 11.00 13.00
Broad, Nos. 4 5 6 ... ℘ doz 14.50 16.50 18.00
Ax Pattern, Nos. 1 2 3 ... ℘ doz 10.00 11.00 12.00

Hay Knives.
"Lightning" ... ℘ doz $18, dis 10@10&10 %
Electric ... ℘ doz $12.50 net
Wadsworth's ... dis 35&5 %
Heath Patent ... ℘ doz $13.50 net
Carter's Needle ... ℘ doz $18, dis 10&5@10&10 %

Hinges.
Spring Hinges—
Geer's Spring and Blank Butts ... dis 33⅓ %
Union Spring Hinge Co.'s ... dis 30 %
American Spring Hinge Co.'s ... dis 30 %
Gem Spring Hinges ... dis 30 %
Barker's Double Acting ... dis 20&10 %
Union Mfg. Co. ... dis 25 %
Bommer's ... dis 25 %
Buckman's ... dis 25 %
Empire ... dis 60&10 %
Acme ... dis 70 %
Climax ... dis 50&10 %
Chicago ... dis 30 @ 30&10 %
Gate Hinges—
Western ... ℘ doz $4.40, dis 55 %
N. E. ... ℘ doz $7.00, dis 55 %
N. E. Reversible ... ℘ doz $5.20, dis 55 %
Clark's, Nos. 1 2 3 ... dis 60&10&2 %
N. Y. State ... ℘ doz $5.00, dis 55 %
Automatic ... ℘ doz $12.50, dis 50 %
Common Sense ... ℘ doz pair $4.50, dis 50 %
Seymour's ... dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20 ... dis 60&10&10 %
Shepard's, No. 3 ... dis 60&10&5 %
Reed's Latch and Hinge ... ℘ doz sets $12, dis 50 %
Wrought Iron Hinges—
Strap and T ... dis 65&10&2 % cash
Screw Hook and Strap ... 8, 10, 12 in. ℘ ℔ ... 3½@3⅝¢; 14 to 36 in. ℘ ℔ ... 2½@2⅝¢
Heavy Welded Hook ... 8 to 12 in., ℘ ℔ ... 3½@3⅝¢; 14 in. & up, ℘ ℔ ... 2½@2⅝¢
Screw Hook and Eye ... ⅝ in. ... ℘ doz $1.50; ¾ in. ... ℘ doz $2.45; ⅞ in. ... ℘ doz $3.80 ... dis 10 %
Rolled Blind Hinges ... dis 60&10 %
Rolled Plate ... dis 70 %
Rolled Raised ... dis 70 %
Plate Hinges / "Providence" ... 8, 10 & 12 in., ℘ ℔ ... 4¢; over 12 in., ℘ ℔ ... 3¢

Hoes.
Garden, Mortar, &c. ... 1st quality, dis 60&10 %
Planter's, Cotton, &c. ... 1st quality, dis 60&10 %
Planter's, Scovil Pattern ... dis 60&10 %
Magic ... ℘ doz $4.75
Grub ... ℘ doz $10.50 @ $12.00, dis 60&2 %

Hog Rings and Ringers.
Perfect Rings ... ℘ doz boxes $2
Perfect Ringers ... ℘ doz. $3
Blair Hog Ringers ... ℘ doz $2.40

Hoisting Apparatus
"Moore's" Hand Hoist, with Lock Brake ... dis 15 %
"Moore's" Differential Pulley Block ... dis 20 %

Hollow-Ware, Iron.
Stove Hollow-Ware, Ground ... dis 50&5@50&10&5 %
Stove Hollow-Ware, Unground ... dis 60@60&10 %
Enameled and Tinned Hollow-Ware—
Kettles ... dis 60&5 @ 60&10&5 %
Oval Boilers, Saucepans and Glue Pots ... dis 40&5@40&10 %
Gray Enameled Ware ... dis 45 %
Rustless Hollow-Ware ... dis 50&5@50&10 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	50¢	55¢	60¢	70¢

Hooks.
Bird Cage, Sargent's list ... dis 66⅔&10 %
Bird Cage, Reading ... dis 60&10@60&10&10 %
Cotton ... ℘ doz $4.00, dis 50 %
Cotton Patented (N. Y. Mallet & Handle W'ks) ... dis 30 %
Cotton (Humason & Beckley Mfg. Co.) ... dis 50&10@60 %
Belt ... dis 80@80&5 %
Bench Hooks ... See Bench Stops
Clothes Line, Sargent's list ... dis 70&10 %
Clothes Line, Reading list ... dis 66⅔&10 %
Ceiling, Sargent's list ... dis 60&10&10 %
Harness, Reading list ... dis 60&10&10 %
Coat and Hat, Sargent's list ... dis 60&10&10 %
Coat and Hat, Reading ... dis 60&10&10 %
Wire Coat and Hat, Gem ... dis 40 %
Wire Coat and Hat, Miles' ... dis 70 %
Tassel and Picture (T. & S. Mfg. Co.) ... dis 50 %
Wrought Staples, Hooks, &c. ... See Wrought Goods
Wire Screw Hooks and Eyes ... See Bright Wire Goods
Grass and Bush ... dis 55 @ 60 %
Whiffletree—Patent ... dis 55 %
Hooks and Eyes—Malleable Iron ... dis 70 %
Hooks and Eyes—Brass ... dis 60&10 %
Fish Hooks, American ... dis 40&10 %

Horse Nails.

	Nos. 5	6	7	8	9	10	
Ausable ... ℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n. ℘ ℔		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin. ℘ ℔		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex ... ℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 40 %
Putnam ... ℘ ℔	27¢	24¢	22¢	21¢	20¢	19¢	dis 5&7 %
Vulcan ... ℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 12½ %
Northwest'n. ℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&5&5 %
Globe ... ℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5&5 %
A. C. ... ℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
C. B.-K. ... ℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Champlain ... ℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
New Haven ... ℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Bridgewater ... ℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 30 %
Saranac ... ℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 25 @ 30 %
Champion ... ℘ ℔	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
Capewell ... ℘ ℔	31¢	28¢	26¢	25¢	24¢	23¢	dis 33⅓&5 %
Star ... ℘ ℔	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&10 %

Horse Shoes.—Burden, at factory ... ℘ keg $3.60
R. I. Horse Shoe Co., Perkins' imp., at factory ... ℘ keg $3.60
Walker's Forged ... ℘ keg $3.60
Mule Shoes, at factory ... ℘ keg $4.60

Hose, Rubber ... 70 @ 70&5 %
N. Y. Belting & Packing Co., Standard ... dis 50&10@50&10&5 %

Ice Awls, Chisels, &c.
American Ice Chisel Pol'd ... ℘ doz $3.00, dis 20 %
National Ice Chisel ... ℘ doz $6.25, dis 20 %
Novelty Ice Breakers ... ℘ doz $6.25, dis 20 %
White's Sliding Head Picks ... ℘ doz $2.50, dis 40 %
Dunlap's Ring Picks ... ℘ doz $2.00, dis 25 %
Wood Head Picks, Sargent's ... ℘ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's ... ℘ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle ... ℘ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall ... ℘ doz $1.25, dis 20&10 %
Combination Ice Tools ... ℘ doz $2.00 net
Acme Ice Pick and Tongs ... ℘ gross $55.00, dis 50&10

Ice Cream Freezers.
Buffalo Champion, S. S. & Co. ... dis 60&2

Ice Tongs.
Champion, S. S. & Co. ... ℘ doz $4.00, dis 25&10 %
Family ... ℘ doz $2.75, dis 20 %

Jack Screws.
Millers Falls list ... dis 50 %

Kettles.
Brass, 7 to 17 in. inclusive ... ℘ ℔ 20¢ Net
Brass larger than 17 inches ... ℘ ℔ 22¢ Net
Enameled and Tea Kettles ... See Hollow-Ware

Keys.
Eagle, Cabinet, Trunk and Padlock ... dis 40&2 %
Hotchkiss' Brass Blanks ... dis 40 %
Hotchkiss' Copper and Tinned ... dis 40 %
Hotchkiss' Padlock and Cabinet ... dis 35 %

Knives.
Ames' Butcher Knives ... dis 25 %
Nichols' Butcher Knives ... dis 40&10 %
Ames' Shoe Knives ... dis 15 @ 20 %
Ames' Bread Knives ... ℘ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives ... dis 20 %
Goodell Co., Butcher, Shoe, Bread, &c. ... dis 40 %
Hay and Straw ... See Hay Knives
Table and Pocket ... See Cutlery

Knobs.
Door Mineral / Door Por. Jap'd / Door Por. Plated / Door Por. ... Same discounts as Door Locks.
Hemacite Door Knobs, new list ... dis 35&5 %
Furniture Plain ... 75¢ gross inch dis 10 %
Furniture, Wood Screws ... dis 25&10 %
Base, Rubber Tip ... dis 70&10&5 %
Picture, Judd's ... dis 60&10&10 %
Picture, Sargent's ... dis 70&10 %
Picture, Hemacite ... dis 35&5 %
Shutter, Porcelain ... dis 65&10 %
Carriage, Japanned ... ℘ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's ... dis 60&10 %
Melting, Reading ... dis 40&10 %
Melting, Monroe's Patent ... ℘ doz. $4.00, dis 40 %
Melting, P. S. & W. ... dis 30&10 %
Melting, Warner's ... dis 30

Lanterns.
Tubular, Standard No. 0, ℘ doz ... $6.75 @ $7.00
Tubular, Standard No. 1, ℘ doz ... 8.50 @ 8.75
Tubular, Lift Wire, No. 0, ℘ doz ... 8.50
Tubular, Lift Wire, No. 1, ℘ doz ... 10.00
Guards for Tubulars, add ℘ doz ... .25
Police, Small, $6.00; Medium, $7.25; Large, $9.75 ... dis 10@15 %
Porter's Tin R. R. ... $10 dis 20 %
Owl ... $9, dis 20@25 %

Lawn Mowers.
Excelsior Roller ... dis 40&3 %
Excelsior Side Wheel ... dis 40&10&3 %
Clipper ... dis 40&10&3 %
Philadelphia ... dis 40&10&3 %

Lemon Squeezers.
Porcelain Lined ... ℘ doz. $6.00, dis 35&5 %
Wood ... ℘ doz. $3.00, dis 35 %
Eureka, Tinned ... ℘ doz. $8.00, dis 10 %
Dunlap's Improved ... ℘ doz. $3.75, dis 20 %
Sammis' ... No. 1, $5; 2, $9; 12, $18 ℘ doz. dis 25&10 %
Townsend's Patent ... $6.00 ℘ doz., dis 33⅓ %
Jennings' "Star" ... $3.00 ℘ doz. net
The "Boss" ... ℘ doz. $4.00, dis 10&10 %
Dean's Nos. 1, ℘ doz. $15.00; 2, $8.00; 3, $5.50 ... dis 55 %
Little Giant ... dis 50 %
Acme ... ℘ gross $55.00, dis 50 %

Lines.
Cotton and Linen Fish, Draper's ... dis 50 %
Draper's Chalk ... dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25 ... dis 25 %
Cotton Chalk ... dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℘ gross ... dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton ... dis 45 %
Wire Clothes, No. 18, $3.50; No. 19, $3; No. 20, $2.50

Locks, Padlocks, Cabinet Locks, &c.
Door Locks, Latches, &c.—
List, Dec. 10, 1884. Some numbers changed Feb. 5, 1885 ... dis 66⅔&2 @ — %
Nimick & Brittan's Burglar-Proof Locks ... dis 66⅔&2 %
Reading Hardware Co. (list Feb. 2, 1885) ... dis 70 %
Perkins' Burglar Proof ... dis 60&25 %
Plate ... dis 33⅓&2 %
F. Many's "Extension Cylinder" ... $10.50 ℘ doz net
Barnes Mfg. Co. ... dis 40 %
Yale Flat Key ... dis 40 %
Dietz Flat Key ... dis 30 %
L. & C. Round Key Latches ... dis 40&10 %
L. & C. Flat Key Latches ... dis 33⅓&10 %
Yale new list ... dis 40 %
"Shepardson" or "U. S." ... dis 35 %
"Felter" or "American" ... dis 40&10 %

Cabinet—
Eagle, Gaylord, Parker, Corbin } Changes made in list price of some numbers March 10, 1884, and Jan. 1, 1885. dis 40&2 % cash.
A. E. Deitz ... dis 30@40 %
Stoddard Lock Co ... dis 30 %
A. E. Deitz, Flat Key Drawer ... dis 30@40 %
"Champion" Night Latches ... dis 40 %
Yale ... dis 40 %
Barnes Mfg. Co ... dis 40 %
Eagle and Corbin Trunk ... dis 25&2 %
"Champion" Cabinet and Combination ... dis 33⅓ %
Romer's ... dis 25 %
Padlocks—
Russell & Erwin, Mallory, Wheeler & Co., Nimick & Brittan Mfg. Co., Wm. Wilcox & Co., Norwich Lock Co. } New list Dec. 23, 1884. dis. 66⅔&2 @ — %.
Yale Lock Mfg. Co.'s ... dis 40 %
Eagle ... dis 25&2 %
Eureka, Eagle Lock Co ... dis 40&2 %
Romer's, Nos. 0 to 91 ... dis 40 %
Romer's, Nos. 200 to 505 ... dis 25 %
A. E. Diets ... dis 35 %
"Champion" Padlocks ... dis 33⅓ %
Hotchkiss ... dis 30 %
"Star" ... dis 45 %
"Horse Shoe," ⅌ doz., $9 ... dis 40 %
Barnes Mfg. Co ... dis 40 %
Nock's ... dis 30 %
Brown's Patent ... dis 25 %
Scandinavian ... dis 90 %
Fraim's Pat. Scandinavian, new list (low) ... dis 60 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish ... ⅌ doz $20.00
Ring Peaves, Common Finish ... ⅌ doz $18.00
Steel Socket Peavies ... ⅌ doz $21.00
Mall. Iron Socket Peavies ... ⅌ doz $19.00
Cant Hooks, "Blue Line" Finish ... ⅌ doz $16.00
Cant Hooks, Common Finish ... ⅌ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish ... ⅌ doz $16.00
Cant Hooks, Mall. Socket Clasp, Common Finish ... ⅌ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ⅌ doz $14.00
Cant Hooks, Clip Clasp, Common Finish. ⅌ doz $12.00
Hand Spikes ... ⅌ doz 6 ft., $15.00; 8 ft., $20

	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Pike Poles, Pike & Hook, ⅌ doz	$11.50	12.50	14.50	17.50	21.50
Pike Poles, Pike only, ⅌ doz	10.00	11.00	13.00	16.00	20.00
Pike Poles, not ironed, ⅌ doz	6.00	7.00	9.00	12.00	16.00
Setting Poles, ⅌ doz	14.00	15.00	17.00	....	....

Swamp Hooks ... ⅌ doz $18.00
Landing Blocks ... ⅌ doz $22.50
Skidding Tongs ... ⅌ doz $51.00
Log Binders ... ⅌ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks ... dis 40 %
Chain Rafting Dogs ... ⅌ 100 $12.50
Ring Rafting Dogs ... ⅌ 100, med., $10.00; large, $12.00
Timber Grapples ... ⅌ doz $30.00

Lustro.
Four-ounce bottles ... ⅌ doz, $1.75; ⅌ gro. $17.00 net

Mallets.
Hickory ... dis 10&10&5 %
Lignumvitæ ... dis 10&10&5 %
Penfield Block Co., Lignumvitæ and Hickory .. dis 30 %

Mattocks.
Regular list ... dis 60&10@60&10&5 %

Meat Cutters.
Dixon's—Nos. 1 2 3 4
⅌ doz. $14.00 17.00 19.00 30.00—dis 45 @ 45&5 %
Miles' Challenge—Nos. 1 2 3
⅌ doz. $22.00 30.00 40.00—dis 45@45&5 %
Woodruff's ... Nos. 100 150
⅌ doz. $15.00 18.00—dis 45 %
Hales' ... Nos. 11 12 13
⅌ doz. $27.00 33.00 50.00 {dis 60&10&2@ 60&10&10&2 %
Draw Cut. Nos. 5 2 3 8 10
Each. $50.00 75.00 80.00 225.00 400.00—dis 20 %
American ... dis 35 %
Nos. 1 2 3 4 B
Each $5.00 7.00 10.00 25.00 50.00 60.00
Enterprise ... dis 33⅓ %
Nos. 10 12 22 32 42
Each $3.00 2.50 4.00 6.00 10.00
Kieser's No. 55 ... $40 ⅌ doz, dis 40 @ 40&5 %
Kieser's Gem ... $25 ⅌ doz, dis 40 @ 40&5 %
Kieser's Monarch ... $45 ⅌ doz, dis 40 @ 40&5 %
Kieser's Butcher ... $40 each, dis 20 @ 20&5 %
Pennsylvania ... dis 40&10 %
Nos. 1 2 3 00
⅌ doz. $24.00 28.00 36.00 28.00
Beef Shavers (Enterprise Mfg. Co.) ... dis 20&10
Chadborn's Smoked Beef Cutter ... ⅌ doz, $66.00

Mincing Knives.
Am. (2d quality), ⅌ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18 ... Net
Lothrop's ... dis 20&10 %
Smith's, ⅌ doz, Single, $2.00; Double, $3 ... dis 40@45 %
Knapp & Cowles ... dis 60 %

Molasses Gates.
Stebbins' Pat's ... dis 75&5 %
Stebbins' Genuine ... dis 70&7½&10 %
Stebbins' Tinned Ends ... dis 40&10 %
Chase's Hard Metal ... dis 50&10 %
Bush's ... dis 20 %
Lincoln's Pattern ... dis 70&10 %
Weed's ... dis 20&10 %
Boss Nos. 1 2 3 4
$7.00 8.00 9.00 10.00 .. ⅌ doz, dis 60&10&10 %

Money Drawers.—⅌ doz., $18.

Nails ... See Trade Report
Wire Nails ... dis 50&10 @ 50&10&5 %
Wire Carpet Nails ... See Tacks

Nail Puller.
Curtiss Hammer ... ⅌ doz $9.00 net
Giant, No. 1 ... ⅌ doz $30.00, dis 10 %
Pelican ... ⅌ doz $9.00, dis 25 %

Nuts and Washers.
Square Nuts ... 9¼¢ off list
Hexagon ... 10¼¢ off list
Washers ... 9¼¢ @ 10¢ off list
In lots less than 100 ℔, ⅌ ℔ add ¼¢ to list 1 ℔ boxes, 1¢ to list.

Nut Crackers.
Table (Humason & Beckley Mfg. Co.) ... dis 40 %
Blake's Pattern ... ⅌ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co ... dis 50 %

Oakum.
Government ... ⅌ ℔ 7¼@7½¢
U. S. Navy ... ⅌ ℔ 6¾@7 ¢
Navy ... ⅌ ℔ 5¾@6 ¢

Oilers.
Zinc and Tin ... dis 60&10&5 %
Brass and Copper ... dis 50&10 %
Malleable (Hammer's), No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ⅌ doz ... dis 10 %
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass ... dis 50 %
Olmstead's Tin and Zinc ... dis 60 %
Olmstead's Brass and Copper ... dis 50 %
Broughton's Zinc ... dis 60 %
Broughton's Brass ... dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co ... dis 50 @ 50&10 %
American Packing ... 11¢
Russia Packing ... 14¢
Italian Packing ... 16¢
Cotton Packing ... 15 @ 18¢

Pails.
Galvanized Water Pails.

Quarts	10	12	14
Hill's Light Weight, ⅌ doz	$2.75	3.00	3.25
Hill's Heavy Weight, ⅌ doz	3.00	3.25	3.75

Iron Clad Mfg. Co.'s list, 7 quart, $4.75; 10 quart, $5.50; 14 quart, $6.25 ... / Fire Buckets, 10 quart, $4.50; 12 quart, $5.00; 14 quart, $5.50 ... } dis 30&10 %

Pencils
Faber's Carpenters' ... high list, dis 50 %
Faber's Round Gilt ... ⅌ gro $5.25 net
Dixon's Lead ... ⅌ gro $4.50 net
Dixon's Lumber ... ⅌ gro $6.75 net
Dixon's Carpenters' ... dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12. dis 60&10@60&10&5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13. dis 60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list ... dis 50&10&10&10 %
Brass Head, Combination list ... dis 50&10 %
Porcelain Head, Sargent's list ... dis 50&10&10 %
Porcelain Head, Combination list ... dis 40&10 %
Niles' Patent ... dis 40 %

Pinking Irons ... ⅌ doz 65¢ net

Planes and Plane Irons.
Wood Planes—
Molding ... dis 15&2 % } Small extras
Bench, First Quality ... dis 20&2 % } sometimes given
Bench, Second Quality .. dis 25&2 % } by jobbers
Iron Planes—
Bailey's Stanley R. & L. Co.) ... dis 20&10 %
The Stanley (S. R. & L. Co.) ... dis 20&10 %
Bailey's "Victor" ... dis 20&10 %
Steer's Iron Planes ... dis 35 %
Meriden Mal. Iron Co.'s Iron Planes ... dis 20&10 %
Davis's Iron Planes ... dis 20&10 %
Plane Irons—
Plane Irons ... dis 20&10 %
Plane Irons, Butcher's ... $5.00 @ $5.25 to £
Plane Irons, Buck Bros ... $5.00 to £
Plane Irons, The Globe Mfg. Co., "Baldwin Iron" ... dis 33⅓ %
L. & I. J. White ... dis 25 %

Pliers and Nippers.
Button's Patent ... dis 33⅓ @ 30&10 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ⅌ doz ... dis 20&10 %
Humason & Beckley Mfg. Co ... dis 50 %
Gas Pliers ... dis 60 %
Eureka Pliers and Nippers ... dis 40 %
Russell's Parallel ... dis 25 %
P. S. & W. Cast Steel ... dis 50 %
P. S. & W. Tinners' Cutting Nippers ... add 6 % dis 10 %

Plumbs and Levels.
Standard List ... dis 70&10@70&10&10 %
Disston's ... dis 45&10 %
Pocket Levels ... dis 70&10@70&10&10 %
Davis' Inclinometers ... dis 10&10 %

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger ... ⅌ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers ... ⅌ doz $36.00, dis 20 %
Eureka Diggers ... ⅌ doz $18 @ $20
Leed's ... ⅌ doz $9.50 @ $10.50
Vaughan's Hollow Tube Post Hole ... per doz, $24.00 ... dis 33⅓ @ 20&10&10 %
Kohler's Little Giant ... ⅌ doz $24
Kohler's Hercules ... ⅌ doz $18.00
Kohler's New Champion ... ⅌ doz $10.00
Schneider ... ⅌ doz $24, dis 2 % cash
Ryan's Post Hole Diggers ... ⅌ doz $24
Cronk's Post Bars ... ⅌ doz $72, dis 50&5 @ 50&10 %

Potato Parers.
White Mountain ... ⅌ doz $5.50
Antrim Combination ... ⅌ doz $8.00
Hoosier ... ⅌ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ⅌ doz $18.00 ... dis 20&10 %
Disston's Pruning Hook ... ⅌ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools ... dis 40 %
Pruning Shears ... ⅌ doz $3.75 @ $4.00 net
Henry's Pruning Shears ... ⅌ doz $4.50 net
Wheeler, M. & Co.'s Combination ... ⅌ doz $12, dis 20 %
Dunlap's Saw and Chisel ... ⅌ doz $8.50, dis 30 %
J. Mallinson & Co., A. & B. Co. list ... dis 33⅓ %

Pulleys.
Hot House, Awning, &c ... dis 66⅔&10 %
Japanned Screw ... dis 66⅔&10 %
Brass Screw ... dis 70&10 %
Japanned Side ... dis 66⅔&10 %
Japanned Clothes Line ... dis 60&10 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 {dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ... dis 50 %
Hay Fork, "F" Common and Pat. Bushed ... dis 20 %
Hay Fork, Tarbox Pat. Iron ... dis 20 %
Shade Rack ... dis 45 %
Tackle Blocks ... See Blocks

Pumps.
Cistern, Best Makers ... dis 50 %
Pitcher Spout, Best Makers ... dis 60 %
Pitcher Spout, Cheaper Goods ... dis 70 @ 70&5 %

Punches.
Saddlers' or Drive, good quality ... ⅌ doz $0.75
Bemis & Call Co.'s Cast Steel Drive ... dis 50&5 %
Bemis & Call Co.'s Springfield Socket ... dis 50&5 %
Spring, good quality ... ⅌ doz $2.50 @ $2.60
Spring, Leach's Patent ... dis 15 %
Bemis & Call Co.'s Spring and Check ... dis 40 %
Solid Tinners' ... ⅌ doz $1.44, dis 55 %
Tinners' Hollow Punches ... dis 20&2 %

Rail.
Sliding Door, Wrought Brass ⅌ ℔ 35¢, dis 20@25 %
Sliding Door, Bronzed Wrt. Iron ... ⅌ foot 7¢
Sliding Door Iron, Painted ... ⅌ foot 4¢, dis 20&10&5 %
Barn Door, Light ... Inch. ½ ⅝ ¾
Per 100 feet ... $2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers— Small. Med. Large
Per 100 feet ... $2.15 2.70 3.25 net
Terry's Wrought Iron, 5¢ ⅌ foot ... net
Victor Track Rail, 7¢ ⅌ foot ... dis 50&2 %

Rakes.
Cast Steel ... dis 60&10 @ 60&10&5 %
Malleable ... dis 60&10 @ 60&10&10 %

Razors.
J. R. Torrey Razor Co ... dis 20 %
Wostenholme & Butcher ... $10 to £, dis 10 %

Razor Strops.
Genuine Emerson ... dis 60 %
Imitation Emerson ... ⅌ doz $2.00, dis 20&10&10 %
Torrey's ... dis 20 %
Badger's Belt and Combination ... ⅌ doz $2

Rivets.
Black and Tinned Iron, Flat Head M Rivets (in packages and in bulk) / Block and Carriage (in C packages) } dis 50 %
Iron Rivets (other than above) in bulk / Black and Tinned Burrs } dis 45 %
NOTE.—Outside Rivets are sold at concessions from above prices.
Copper Rivets and Burrs ... dis 60&5 @ 60&10 %

Nos.	7	8	9	10	11	12	13	14	15
⅌ ℔	.49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Rivet Sets ... dis 50&2 %

Rods.
Stair, Brass ... dis 25&5 %
Stair Black Walnut ... ⅌ doz 50¢

Rollers.
Barn Door, Sargent's list ... dis 60&10&10 %
Acme (Anti-Friction) ... dis 55 %
Union Barn Door Roller ... dis 70 %

Rope.
Mnf'rs list, October 5, 1885.
Manila ... ½ inch and larger ⅌ ℔ 13½¢
Manila ... ⅜ inch ⅌ ℔ 14 ¢
Manila ... ¼ and 5-16 inch ⅌ ℔ 14½¢
Manila Tarred Rope ... ⅌ ℔ 13 ¢
Manila, Hay Rope ... ⅌ ℔ 13½¢
Sisal ... ½ inch and larger ⅌ ℔ 9 ¢
Sisal ... ⅜ inch ⅌ ℔ 9½¢
Sisal ... ¼ and 5-16 inch ⅌ ℔ 10 ¢
Sisal, Hay Rope ... ⅌ ℔ 9 ¢
Sisal, Tarred Rope ... ⅌ ℔ 8½¢
Sisal, Single Ply Lath Yarn ... ⅌ ℔ 8 ¢ } Dis 1¢ ⅌ ℔.
Cotton Rope ... ⅌ ℔ 15 @ 18¢ net
Jute Rope ... ⅌ ℔ 7¢

Rules.
Boxwood ... dis 80&5 @ 80&10 %
Ivory ... dis 55 @ 55&10 %
Stephens' Ivory ... dis 50 %

Sad Irons.
From 4 to 10, at factory ... ⅌ 100 ℔ $2.25 @ $2.50
Self-Heating ... ⅌ doz. $9.00 net
Self-Heating, Tailors' ... ⅌ doz. $18.00 net
Gleason's Shield and Toilet ... dis 25 %
Mrs. Pott's Irons, Double Pointed ... dis 35 @ 40 %
Mrs. Pott's Irons, Square Back ... dis 35 @ 40 %
Enterprise Star Irons, new list, July 20, 1882 ... dis 35 %
Combined Fluter and Sad Iron ... ⅌ doz. $15.00, dis 15 %
Chinese Laundry (N. E. Butt Co.) ... 8½¢, dis 15 %
New England ... 5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint, 00 to 1½ ... $4.50 ⅌ ream
Baeder & Adamson's Flint, 2, 2½ & 3 ... 5.00 ⅌ ream
Baeder & Adamson's Flint, assorted ... 4.75 ⅌ ream
Baeder & Adamson's Star ... 3.75 ⅌ ream } dis 40@40&5 %
Bartles Best Flint, Nos. 00 to 1½ ... ⅌ ream $4.50
Bartles Best Flint, assorted ... ⅌ ream 4.50
Bartles Best Flint, Nos. 2 to 3 ... ⅌ ream 5.00
Bartles Best Flint, No. 3½ ... ⅌ ream 5.50
Columbia Flint, all Nos ... ⅌ ream 4.00
Madison Mills Flint, all Nos ... ⅌ ream 3.50 } dis 40@40&5&5 %
Emery Paper, 00 to 1½, $6.50; 2, $7.50; 2½, $9.50 ... dis 40 @ 40&5 %
Emery Cloth, B. A. & Co., 00 to 1½, $18; 2, $20; 2½, $24 ... dis 40 @ 40&5 %
Emery or Crocus Cloth, Sibley, 9x12 in., $16.00 / Emery or Crocus Cloth, Sibley, 7x9 in., $10.50 } dis 20 %
New England, same list as B. & A. Flint ... dis 40&5 %
Sand Paper without brand ... ⅌ ream, $2.10 net

Sash Cord.
Common ... ⅌ ℔, 12½¢ @ 13¢ net
Patent ... ⅌ ℔, 15¢ @ 16¢ net
White Cotton Braided ... ⅌ ℔ 32¢ @ 33¢
Common Russia Sash ... ⅌ ℔ 14¢
Patent " " ... " 18¢
Cable Laid Italian " ... " 26¢
India Cable Laid " ... " 14¢
Silver Lake, A Quality, White ... 50¢. dis 10&10 %
Silver Lake, A Quality, Drab ... 55¢. dis 10&10 %
Silver Lake, B Quality, White .. 50¢. dis 10&10&10@30 %
Silver Lake, B Quality, Drab ... 55¢. dis 10&10&10@30 %
Silver Lake, C Quality, White (only) ... 29¢ @ 30¢
Spring Lake, A Quality ... 50 @ 55¢. dis 10&10&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ⅌ gross ... dis 33⅓ %
Ferguson's ... dis 33⅓ %
Morris ... dis 60 %
Morris' Triumph (revised list) ... dis 60&10 %
Walker's ... dis 10 %
Attwell Mfg. Co ... dis 25 @ 33⅓ %
Hammond's Window Springs ... dis 40 %
Common Sense, Japanned, Coppered and Bronzed ... ⅌ gross
Common Sense, Nickel Plated ... ⅌ gross $12.00 net
Universal ... dis 30 %
Kempshall's Gravity ... dis 60 %
Kempshall's Model ... dis 60@60&10 %
Corbin's Daisy ... dis 60&5@60&10 %
Payson's Perfect ... dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list March, 1885 ... dis 33⅓ %
Hugunin's New Sash Locks, list March, 1885 .. dis 33⅓ %
Stoddard "Practical" ... dis 10 %
Ives Patent ... dis 55&10 %

Sash Weights.
Solid Eyes, in ton lots ... ⅌ ton, $30

Sausage Stuffers or Fillers.
Miles' "Challenge" ... ⅌ doz. $30, dis 45 %
Perry ... ⅌ doz. No. 1, $15; No. 0, $21. dis 45 %
Draw Cut No. 4 ... each, $30.00, dis 20 %
Enterprise Mfg. Co ... dis 25@33⅓ %
Silver's ... dis 25 %

Saws.
Disston's Circular, Mill and Cross Cut ... dis 45&10 %
Disston's Hand, Panel, Rip, &c ... dis 20&10 %
Atkins' Silver Steel Circular ... dis 40 %
Atkins' Selected Steel Circular ... dis 50 %
Atkins' Silver Steel Diamond X Cuts ... ⅌ foot 75¢
Atkins' Concave Tooth Dexter X Cuts ... ⅌ foot 55¢
Atkins' Special Steel Diamond X Cuts ... ⅌ foot 34¢
Atkins' Champion Tooth X Cuts ... ⅌ foot 32¢
Atkins' Hollow Back X Cuts ... ⅌ foot 22¢
Atkins' Band ... dis 25 %
W. M. & C., Hand ... dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular ... ⅌ foot 26¢
W. M. & C. X Cuts, Thin Back ... ⅌ foot 29¢
Peace Circular and Mill ... dis 45&10 %
Peace Hand Panel and Rip ... dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard ... ⅌ foot 25¢
Peace Cross Cuts, Thin Back ... ⅌ foot 28¢
Peace Band Saws, all widths ... dis 20&10 %
Richardson's Circular ... dis 45 %
Richardson's Mill ... dis 45 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 25¢.
Richardson's Hand, Panel, Butcher, &c ... dis 25&5 %

Saws, Hack.—See Hack Saws.

Saw Frames.
White, Vermont ... ⅌ doz $1.50, dis 25&10 %
Red, Polished and Varnished ... ⅌ doz $1.50, dis 10 %
Saw Rods ... $10 list dis 10&10 %

Saw Sets.
Stillman's Genuine ... ⅌ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imitation .. ⅌ doz $3.25 and $5.25, dis 40&5 %
Common Lever ... ⅌ doz $2.00, dis 40&5 %
Leach's ... No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's ... dis 20&10 @ 20&10&5 %
Hammer, Hotchkiss ... $5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent ... dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer. dis 30&5 %
Bemis & Call Co.'s Plate ... dis 10 %
Bemis & Call Co.'s Cross Cut ... dis 12½ %
Aiken's Genuine ... $13.00, dis 50&10 %
Aiken's Imitation ... $7.00, dis 50&5 %
Hart's Patent Lever ... dis 20 %
Disston's, Star, $9, No. 15 Hammer, $5.50 ... dis 20&10 %
Atkins' Adjustable ... per doz $6.00
Atkins' Criterion ... per doz $7.00
Morrill's, No. 1, $15.00; Nos. 3 and 4, $24 ... dis 40&10 @ 40&10&5 %
Croissant (Keller), No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %
Boynton's No. 1, $12 ⅌ doz; No. 2, $10 ... dis 25 %

Saw Tools.
Atkins' Patent ... per doz sets $6.00

Scales.
Hatch, Counter, No. 171 ... ⅌ doz $42.00, dis 50&10 %
Hatch, Tea, No. 161 ... ⅌ doz $15.00, dis 50&10 %
Union Platform, Plain ... $2.15 @ 2.30
Union Platform, Striped ... $2.30 @ 2.40
Chatillon's Grocers ... dis 40 %
Chatillon's Eureka ... dis 25 %
Chatillon's Family Favorite ... dis 30 %
Family Universal, ⅌ doz, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's ... dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 1882 .. dis 60&5 @ 60&10 %
Scale Beams, Custer ... dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.) $6.50, dis 20&10 %
Box, 1 Handle ... ⅌ doz $4.00, dis 10 %
Box, 2 Handle ... ⅌ doz $6.00, dis 10 %
Defiance Box and Ship ... dis 20&10 %
Foot ... dis 50&10 %
Ship, Common ... ⅌ doz $3.50 net
Ship, Providence Tool Co ... dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame ... dis 33⅓ %
Screen Corner Irons, Warner's ... dis 33⅓ %

Screw Drivers.
Douglas Mfg Co ... dis 20&10&10 %
Disston's ... dis 45&10 %
Disston's Patent Excelsior ... dis 45&10 %
Buck Bros ... dis 30 %
Stanley R. & L. Co.'s Varnished Handles ... dis 60&10 %
Stanley R. & L. Co.'s Black Handles ... dis 50&10 %
Sargent & Co.'s Nos. 1 & 20 Forged Blade .. dis 70&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel. dis 55&10&10 %
Sargent & Co.'s No. 60, Round Blade ... dis 60&10&10 %
Knapp & Cowles' No. 1 ... dis 60&10&10 %
Knapp & Cowles' No. 1 Extra ... dis 50&10 %
Knapp & Cowles' No. 00 & 4 ... dis 40 %
Sets interchangeable ... ⅌ doz $18.00, dis 25 %
Champion ... dis 25 %
Clark's Patent ... dis 20&10 %
Crawford's Adjustable ... dis 30 %
Knapp & Cowles' Screw-Driver Bitts ... ⅌ doz 30¢
Ellrich's Socket and Ratchet ... dis 25 %
Allard's Spiral, new list ... dis 25 %

Screws.
Wood Screws—
Am. Screw Co.'s list, Jan. 1, 1885:
Flat Head Iron ... dis 80 %
Round Head Iron ... dis 75&10 %
NOTE.—On above Screws an extra discount of 10 % ¾ inch and smaller is given.
Flat Head Brass ... dis 75&10 %
Round Head Brass ... dis 75 %
Russell & Erwin list April 1, 1885:
Flat Head Iron ... dis 85 %
Round Head Iron ... dis 83⅓ %
Flat Head Brass ... dis 85 %
Round Head Brass ... dis 85¼ %
Brass and Silver Capped Screws ... dis 40 %
Machine—
Flat Head, Iron ... dis 60 %
Round Head, Iron ... dis 55 %
Bench and Hand—
Bench, Iron ... dis 55&10 @ 55&10&10 %
Bench, Wood, Beech ... ⅌ doz $2.25
Bench, Wood, Hickory ... dis 20&10 %
Hand, Wood ... dis 25&10 @ 25&10&5 %
Lag or Coach ... dis 75&10 @ 80 %
Coach, Patent Gimlet Point ... dis 75 @ 75&5 %
Bed ... dis 35 %
Hand Rail, Sargent's ... dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s ... dis 70 %
Hand Rail, Am. Screw Co ... dis 70 %

Scroll Saws.
Lester, complete, $10.00 ... dis 25 %
Rogers, complete, $4.00 ... dis 25 %

Scythe Snaths ... dis 40&5&2 %

Shears.
American (Cast) Iron ... dis 75&10 %
Pruning ... See Pruning Hooks and Shears
Barnard's Lamp Trimmers ... ⅌ doz $3.75
Tinners' ... dis 20&2 %
Seymour's, List, Dec., 1881 ... dis 60&10&5 %
Heinsch's, List, Dec., 1881 ... dis 60&10 %
Heinsch's Tailor's Shears ... dis 33⅓ %
First quality C. S. Trimmers ... dis 80 %
Second quality C. S. Trimmers. dis 80&10 @ 80&10&5 %
Acme Cast Shears ... dis 10&10 %
Diamond Cast Shears ... dis 10 %
Clipper ... dis 10&10 %
Victor Cast Shears ... dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel ... dis 40 %

Sheaves.
Sliding Door—
M. W. & Co., list ... dis 66⅔&5&2 %
R. & E., list ... dis 60&10&2 %
Corbin's list ... dis 60&10&2 %
Patent Roller ... dis 60&10&2 %
Patent Roller, Hatfield's ... dis 70 %
Russell's Anti-Friction ... dis 60&10&2 %
Moore's Anti-Friction ... dis 60 %
Sliding Shutter—
R. & E. list ... dis 60&10&2 %
Sargent's list ... dis 66⅔&10 %
Reading list ... dis 66⅔&10 %

Ship Tools.
L. & I. J. White ... dis 20&5 %
Albertson Mfg. Co ... dis 25 %

Shovels and Spades.
Ames' Shovels, Spades, &c., Ames' brands ... dis 20 %
Some special brands of Ames' goods ... dis 20&10 %
Griffith's Black Iron ... dis 50&10 %
Griffith's Steel ... dis 60 %
Griffith's Solid Cast Steel R. R. Goods ... dis 20 %
Old Colony ... dis 15 %
Groom Shovel Co ... dis 20 @ 20&5 %
Hussey, Binns & Co ... dis 20 @ 20&5 %
Lehigh Mfg. Co ... dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882 ... dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list ... dis 50 %
R. T. Pettebone, Pat. Scoops, new list ... dis 20 %
Remington's (Lowman's Patent) ... dis 30 @ 30&10 %
Rowland's, Black Iron ... dis 50&10 %
Rowland's Steel ... dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron and Brass Head, R. & E. .. dis 60&10&2@60&10&5 %
Iron and Brass Head, P. S. & W. dis 60&10&2@60&10&5 %

Sieves.
Buffalo Metallic, S. S. & Co., new list ... dis 50&20 %
Barler's Flour Sifters ... ⅌ doz $2 50

Slates.
School, by case ... dis 45 @ 50 %

Soldering Irons.
Covert's Adjustable ... dis 60&20 %

Spoke Shaves.
Iron ... dis 45 %
Wood ... dis 30 %
Bailey's (Stanley R. & L. Co.) ... dis 40&10 %
Stearns' ... dis 30&10 %

Spoke Trimmers.
Bonney's ... ⅌ doz $10.00, dis 50 %
Stearns' ... ⅌ doz $9.00, dis 20&10 %
Ives' ... No. 1, $15.00; No. 2, $12.00 ⅌ doz, dis 55&10 %
Douglass' ... ⅌ doz $9.00, dis 20 %

Spoons.
Basting, Central Stamping Co.'s list ... dis 33⅓&2 %
Solid Table and Tea, Central Stamping Company's list ... dis 33⅓&2 %
Buffalo, S. S. & Co ... dis 50&10 %
Britannia ... dis 60&10 %
Meriden Brit. Co., Rogers ... dis 50&5 %
Wm. Rogers Mfg. Co ... dis 50&10 %
Holmes, Booth & Haydens ... dis 50&10@60 %
Holmes & Edwards Silver Co ... dis 50&10@60 %
German Silver ... dis 50 %
Cast Steel, Silver Plated ... dis 40 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30 ... dis 50 @ 50&10 %
Tin (Cowles Hdw. Co) ... dis 10 %
Tin (Cowles Hdw. Co.), case lots ... dis 20 %

Springs.
Elliptic, Concord, Platform and Half Scroll ... dis 60&10&10 %

Squares.
Steel and Iron / Nickel Plated } dis 60&10 & 10@70 %
Try Square and T Bevels ... dis 60&10 %
Disston's Try Square and T Bevels ... dis 45&10 %
Winterbottom's Try and Miter ... dis 20&10 %

Staples.
Fence Staples, Galvanized ... ⅌ ℔, 4½ @ 5¢

Steelyards ... dis 40&10@50&5 %

Stocks and Dies ... dis 5&10 %
"Lightning" Screw Plate ... dis 10 @ 10&10 %

Stone.
Hindostan No. 1, 3½¢; Axe, 4¼¢; Slips, 5½¢ ...
Sand Stone ... ⅌ ℔, 2½¢
Washita Stone, Extra ... ⅌ ℔, 17@18¢
Washita Stone, No. 1 ... ⅌ ℔, 14¢ @ 14½¢
Washita Stone, No. 2 ... ⅌ ℔, 11¼¢ @ 11½¢
Washita Stone Slips, No. 1 ... ⅌ ℔, 28¢ @ 29¢
Arkansas Stone, No. 1, 4 to 6 in ... ⅌ ℔, $1.45@1.50
Arkansas Stone, No. 1, 6 to 9 in ... ⅌ ℔, $1.75
Turkey Oil Stone ... 4 to 8 in., ⅌ ℔, 60¢
Turkey Slips ... ⅌ ℔, $2.00
Lake Superior ... ⅌ ℔, 17¢
Lake Superior Slips ... ⅌ ℔, 31@32¢

Stove Boards.
Buffalo Zinc, S. S. & Co ... dis 50 %

Stove Polish.
Joseph Dixon's ... ⅌ gro $6.00, dis 10 %
Gem ... ⅌ gro $4.50, dis 10 %
Gold Medal ... ⅌ gro $6.00, dis 25 %
"Mirror" ... ⅌ gro $6.00, dis — %
Lustro ... ⅌ gro $4.75 net
Ruby ... ⅌ gro $3.75 net
Rising Sun ... ⅌ gro $5.75 net
Dixon's Plumbago ... ⅌ ℔ 8¢ net
Boynton's Noon Day, ⅌ gro ... $5.00

Tacks, Brads, &c.
List, Sept. 1, 1882
American Iron Carpet Tacks, all kinds ... dis 65 %
Steel Carpet Tacks, all kinds ... dis 60 %
Swedes Iron Carpet Tacks, all kinds ... dis 60 %
Swedes Iron Tacks ... dis 60 %
Swedes Iron Upholsterers' Tacks ... dis 60 %
Tinned Swedes Iron Tacks ... dis 60 %
Tinned Swedes Iron Upholsterers' Tacks ... dis 60 %
American Iron Cut Tacks ... dis 60 %
Copper Tacks ... dis 55 %
Copper Finishing and Trunk Nails ... dis 55 %
Cigar Box Nails ... dis 50 %
Finishing Nails ... dis 50 %
Hungarian Nails and Miners' Tacks ... dis 45 %
Gimp and Lace Tacks ... dis 60 %
Tinned Gimp and Lace Tacks ... dis 60 %
Trunk and Clout Nails ... dis 40 %
Tinned Trunk and Clout Nails ... dis 40 %
Basket Nails ... dis 40 %
Chair Nails ... dis 40 %
Common and Patent Brads ... dis 50 %
Tinned Capped Trunk Nails ... dis 50 %
Looking-Glass Tacks ... dis 30 %
Picture-Frame Points ... dis 30 %
Leathered Carpet Tacks ... dis 30 %
Brush Tacks ... dis 30 %
Shoe Finders' ... List July 1, 1885
Lining and Saddle Nails ... List June 19, 1885 } Extra 10&2 % for cash.
Double-pointed Tacks ... dis 75&10 @ 75&10&5 %
Wire Carpet Nails ... dis 50 %
Wire Carpet Nails, R. & E. Mfg. Co ... dis 40&10 %
Steel Wire Brads, R. & E. Mfg. Co ... dis 40&10 %

Tap Borers.
Common and Ring ... dis 20&10 %
Ives' Tap Borers ... Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers ... Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co ... dis 20&10 %
Clark's ... dis 33⅓&35 %

Tapes, Measuring.
American ... dis 25&10 %
Spring ... dis 40 %
Chesterman's ... Regular list dis 25 @ 30 %

Thermometers.
Tin Case ... dis 80 @ 80&5 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.) ... dis 20&2 %
Punches—See Punches.
Snips, J. Mallinson & Co ... dis 33⅓ %

Tinware.
Stamped, Central Stamping Co.'s list ... dis 33⅓&2 %
Japanned, Central Stamping Co.'s list ... dis 33⅓&2 %
Pieced, Central Stamping Co ... dis 33⅓&2 %
Pieced, S. S. & Co ... dis 60 %
Japanned, S. S. & Co ... dis 25&10 %
Stamped, S. S. & Co., new list ... dis 33⅓&2 % } Extras sometimes given.

Transom Lifters.
Wollensak's Patent Iron Bronzed ... dis 50 %
Reiher's Improved Self-Locking (Class 301) ... dis 40 %
Reiher's Improved Set Screw (Class 201) ... dis 45 %
Reiher's (Class 101) ... dis 50&10 %
Excelsior ... dis 50&10&2 %
Shaw's ... dis 45&10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion) ... dis 20&10 %
Wood Bottom ... ⅌ doz $5.00 @ $5.25
All Iron ... ⅌ doz $4.25
Nashua Lock Co.'s ... ⅌ doz $18 00 dis 50@55 %
Wilson's ... dis 55 %
Clipper (Sargent & Co.) ... ⅌ doz $24, dis 50&10&10 %
Acme ... ⅌ doz $20.00, dis 40 %

Traps.
Game—
Newhouse ... dis 35 %
Oneida Pattern ... dis 60&10&10 %
Game, Blake's Patent ... dis 40&10 %
Mouse and Rat—
Mouse, Wood, Choker ... ⅌ doz holes, 15¢
Mouse, Round Wire ... ⅌ doz $1.50, dis 10 %
Mouse, Cage, Wire ... ⅌ doz $2.50, dis 10 %
Mouse, Catch-'em-alive ... ⅌ doz $2.50, dis 15 %
Mouse, "Bonanza" ... ⅌ gross $10 net
Mouse, Delusion ... ⅌ gross $18.00, dis 15 %
Rat, "Decoy" ... ⅌ doz $10.00, dis 10 %

Trowels
Lothrops' Brick and Plastering ... dis 20&10 %
Reed's Brick and Plastering ... dis 15 %
Disston's Brick and Plastering ... dis 20&10 %
Peace's Plastering ... dis 25 %
Clement & Maynard's ... dis 20 %
Rose's Brick ... dis 15 %
Brade's Brick ... dis 25 %
Worrall's Brick and Plastering ... dis 20 %
Garden ... dis 70 %

Triers.
Butter and Cheese ... dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882 ... dis 40 %

Twine.

			BC.	B.
No. 9, Flax Twine,	¼ and ½ ℔	Balls	24¢	31¢
No. 12, " "	¼ and ½	"	22¢	24¢
No. 18, " "	¼ and ½	"	20¢	22¢
No. 24, " "	¼ and ½	"	20¢	22¢
No. 36, " "	¼ and ½	"	19¢	21¢
No. 264, Mattrass,	¼ and ½	"		50¢

Chalk Line, Cotton, ½ ℔ Balls ... 28¢
Mason Line, Linen, ½ " ... 60¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine) ... 14½¢
3-Ply Hemp, 1 ℔ Balls ... 15¢
3-Ply Hemp, 1½ ℔ Balls ... 13¢
Cotton Wrapping, 5 Balls to ℔ ... 14¢ @ 20¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls ... 11¢
Wool ... 6¢ @ 6½¢
Paper ... 13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz ... 17¢

Vises.
Solid Box ... dis 50&10 @ 60 %
Parallel—
Fisher & Norris Double Screw ... dis 15&10 %
Stephens' ... dis 25 %
Parker's ... dis 20 @ 25 %
Wilson's ... dis 55 %
Howard's ... dis 40 %
Bonney's ... dis 40 %
Merrill's ... dis 15@20 %
Sargent's ... dis 66⅔&10 %
Backus and Union ... dis 40 %
Double Screw Leg ... dis 15&10 %
Prentiss ... dis 20@25 %
Simpson's Adjustable ... dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3 ... ⅌ doz $15.00, dis 40 %
Stearn's ... dis 40 %
Hopkins' ... ⅌ doz $17.50, dis 10 %
Reading ... dis 40&10 %
Wentworth ... dis 20&10 %
Cowell Hand Vises ... dis 20 %
Bauer's Pipe Vises ... dis 10 %

Washer Cutters.
Smith's Patent ... ⅌ doz $12.00, dis 20&10&10 %
Johnson's ... ⅌ doz $11.00, dis 33⅓ %
Penny's ... ⅌ doz Pol. $14; Jap'd, $16 .. dis 55 %
Appleton's ... ⅌ doz $16.00, dis 60&10 %
Bonney's ... dis 30&10 %

Washers.—See Nuts and Washers

Well Buckets, Galvanized.

Well Wheels—8 in., $1.85; 10 in., $2.15; 12 in., $2.90
Bill's ... ⅌ doz., 12 qt., $3.50 · 14 qt., $4.50
Iron Clad ... ⅌ doz., 14 qt., $8—dis 25 %

Wire.
Brass and Copper, new list, Jan. 18, '84. dis 30@30&7½ %
Iron—
Market, Bright & Annealed, No. 0 to 18 ... dis 70 %
Market, Coppered ... dis 65 %
Market, Galvanized ... dis 60&5 %
Market, Tinned, Tinned list ... dis 60&5 %
Stone, Bright & Annealed Nos. 19 to 26 ... dis 70 %
Stone, Bright & Annealed Nos. 27 to 36 ... dis 75 %
Stone, Galvanized, Nos. 19 to 30 ... dis 55 %
Stone, Tinned, Tinned list ... dis 60 %
Tinned Broom Wire ... dis 65 %
Annealed Fence, Nos. 8 & 9 ... dis 70 %
Annealed Grape, Nos. 10 to 14 ... dis 70 %
Barb Fence ... See Trade Report
Wire on Spools ... dis 65 %
Cast Steel Wire ... dis 55@55&5 %
Stubs' Steel Wire ... $6.00 to £, dis 30 %
Steel Music Wire, Nos. 12 to 30 ... 55¢ ⅌ ℔
Picture Wire ... dis 60&10 %
Barb Wire Safety Guards ... ⅌ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth.
Green, drab and black, ⅌ 100 sq. ft ... $2

Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S" ... dis 33⅓ %
Baxter's Diagonal ... dis 35&10 %
Coes' Genuine ... cash in 10 days, dis 60&3 %
Coes' "Mechanics'" ... dis 60&10&3 %
Coes' Pattern, Malleable ... dis 80&5 %
Coes' Pattern, Wrought ... dis 75&10&5 @ 80 %
Girard Standard ... dis 70 @ 70&5 %
Girard Agricultural ... dis 80 %
Bemis & Call's Patent Combination ... dis 30&5 %
Bemis & Call's Merrick's Pattern ... dis 35 %
Bemis & Call's Brigg's Pattern ... dis 25 %
Bemis & Call's Cylinder or Gas Pipe ... dis 40&5 %
Bemis & Call's No. 3 Pipe ... dis 35&5 %
Aiken's Pocket (Bright) ... $6.00, dis 50&10 %
The Favorite Pocket (Bright) ... ⅌ doz $4.00, dis 40 %
Webster's Patent Combination ... dis 25 %
Boardman's ... dis 25@25&10 %
Always Ready ... dis 25&5 %
Alligator ... dis 40&10 %
Donohue's Engineer ... dis 25 %
Acme, Bright ... dis 60&3 %
Acme, Nickeled ... dis 45 %
Acme, Bicycle, 4½ in ... dis 45 %
Sterling Wrench, Wrought ... dis 75&10&5 @ 80 %
Sterling Wrench, Malleable ... dis 80 @ 80&5 %

Wringers.

	Per doz.
Adams & Co. No. 8	$30.00
Advance	30.00
Excelsior, for Stationary Tubs, No. E, 10-inch	39.00
Excelsior, for Stationary Tubs, No. F, 11-inch	43.50
Excelsior, with Folding Bench, No. A, 10-inch	48.00
Excelsior, with Folding Bench, No. B, 11-inch	52.50
Leader	28.00
"Metropolitan," No. 2	33.00
"Metropolitan," No. 2½	30.00
Novelty, for Common Tubs, No. 2, 10-inch	30.00
Novelty, for Common Tubs, No. 3, 11-inch	34.50
No. 99 Improved 2½	30.00
Peerless No. 2½	30.00
Peerless No. 3½	34.50
Universal, No. 2½	30.00
Universal, No. 2	33.00
Universal, No. 1¼	34.50
Universal, No. 1½	39.00
Universal, No. 1	57.00
Universal, for Set Tubs, A 2½	39.00
Universal, for Set Tubs, E 1½	48.00
Universal, for Set Tubs, C 1	66.00

(dis $3 ⅌ doz.)

Wrought Goods.
Staples, Hooks, &c ... dis 80&10 @ 80&15 %

WHOLESALE METAL PRICES, October 7, 1885.

METALS.

IRON.—Duty: Bars, 8-10¢ to 1 1-10¢ ₩ lb; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ₩ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ₩ lb. Railroad Bars weighing more than 25 lb ₩ yard, 7-10¢ of 1¢ ₩ lb.

Standard American Pig Iron.

Foundry No. 1 X	₩ ton	$17.50 @ 18 50
Foundry No. 2 X	₩ ton	16.00 @ 16 50
Gray Forge	₩ ton	15.00 @ 15 50

No. 1 Scotch Pig Iron.

Carnbroe	₩ ton	18.50 @ 19.00
Coltness	₩ ton	19.50 @ 20.00
Shotts	₩ ton	19.50 @ 20.00
Glengarnock	₩ ton	18.50 @ 19.00
Gartsherrie	₩ ton	19 50 @ ....
Langloan	₩ ton	20.00 @ ....
Summerlee	₩ ton	19.00 @ 19.50
Dalmellington	₩ ton	18.50 @ ....
Eglinton	₩ ton	17.50 @ 18.00
Clyde	₩ ton	18 50 @ 19.00

Rails.

Steel, at Eastern mills	₩ ton	$33.00 @ 31.00
Old Rails, Ts	₩ ton	$17.25 @ 17.50

Scrap.

Wrought, ₩ ton, from yard ..... 18.00 @ 18.50

Bar Iron from Store.

Common Iron:		
¾ to 1 in. round and square...	₩ lb	1.6 @ 1.75¢
1 to 6 in. x ⅝ to 1 in		
Refined Iron:		
¾ to 2 in. round and square...	₩ lb	1.85 @ 2.3¢
1 to 6 in. x ⅝ to 1 in		
1 to 6 in. x ½ and 5-16	₩ lb	1.9 @ 2.4¢
Rods—⅜ and 11-16 round and sq...	₩ lb	1.7 @ 2.2¢
Bands—1 to 6x8-16 to No. 12	₩ lb	2 @ 2.5¢
"Burden's Best" Iron, base price	₩ lb	2.9¢
Burden's "H. B. & S." Iron, base price	₩ lb	2.5¢
Norway Nail Rods		5 @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 16	₩ lb 2.70 @ 3 ¢	3½¢
17 to 20	₩ lb 3 @	3½¢
21 to 24	₩ lb 3 @	3½¢
25 and 26	₩ lb 3.12½ @	3¾¢
27	₩ lb 3.25 @	3¾¢
28	₩ lb 3.37½ @ 3.50	¢ ¢

	B B.	2d qual.
Galvanized, 10 to 20	₩ lb 5 ¢	4½¢
Galvanized, 21 to 24	₩ lb 5½¢	5 ¢
Galvanized, 25 to 26	₩ lb 6 ¢	5½¢
Galvanized, 27	₩ lb 6½¢	6 ¢
Galvanized, 28	₩ lb 7 ¢	6½¢
American Russia	₩ lb A, 10¢	B, 9¢
Russia	₩ lb 10½¢ @ 11	¢
American Cold Rolled B. B	₩ lb 5 ¢ @ 7	¢

Iron Wire.—(*See Wire.*)

STEEL.—Duty. Ingots, Bars, Sheets, &c., valued at 4¢ ₩ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ₩ lb, 2¢ ₩ lb; valued above 7¢ and not above 10¢ ₩ lb, 2½¢ ₩ lb; valued above 10¢ ₩ lb, 3½¢ ₩ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1½¢ ₩ lb in addition to above; Steel Circular Saw Plates, 1¢ ₩ lb in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, ¼ to 3 inches, net	10 @ 14¢
Adamantine Shoes and Dies	8 @ ..¢
Magnet Steel	14 @ ..¢

English Steel.

Best Cast	₩ lb 15½¢
Extra Cast	₩ lb 16½ @ 17½¢
Circular Saw Plates	₩ lb 14½¢
Round Machinery, Cast	₩ lb 10½¢
Swaged, Cast	₩ lb 16½¢
Best Double Shear	₩ lb 15½¢
Blister, 1st quality	₩ lb 14 ¢
German Steel, Best	₩ lb 10 ¢
2d quality	₩ lb 9 ¢
3d quality	₩ lb 8 ¢
Sheet Cast Steel, 1st quality	₩ lb 15½¢
2d quality	₩ lb 14½¢
3d quality	₩ lb 12½¢

TIN.—Duty Plates, Sheets, Tagger and Terne, 1¢ ₩ lb; Bars, Block and Pigs free.

Banca	₩ lb .... @ 22 ¢
Straits	₩ lb 21½¢ @ 22 ¢
English	₩ lb 21½¢ @ 21½¢
Bar	₩ lb 23½¢ @ ....

Charcoal Tin Plates.

I C 10x14 225 sheets	₩ box $5.00	@ 7.25
I C 12x12 225 sheets	" 5.00	@ 7.50
I C 20x28, 112	" 10.00	@ 14.50
I X 10x14 225 sheets	" 6.25	@ 9.25
I X 12x12 225 sheets	" 6.25	@ 9.50
I X 14x20, 112	" 6.25	@ 9.25
D C 12½x17 100	" 5.00	@ 5.50
D X 12½x17, 100	" 6.25	@ 7.00
For each additional X add	" 1.25	@ 2.00

Coke Tin Plates.

	Best.	Ordinary
I C 10x14	$4.75	$4.62½ @ ....
I C 14x20		
I C 12x12	4.75	4.62½ @ ....
I C 10x30, gutters, 225 sheets	8.00	7.25
I C 20x28, 112 sheets	....	10.25

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M. F.	$7	....	....
I C 14x20 Old Process	....	....	$6.87½
I C 20x28	"	....	14.25
I C 14x20	$4.75 @ 4.87½		
I X 14x20	6.25 @ 6.75		
I C 20x28	9 25 @ 9.75	8.75	8.62½ @ 8.75
I X 20x28	12.75 @ 14.50		
I C 20x200	13.50 @		

Tin Boiler Plates.

IXX 14x26, 2 sheets for No. 7, 112 sheets	@ $12.00
IXX 14x28, 2 " " No. 8, "	@ 13.00
IXX 14x31, 2 " " No. 9, "	@ 15.00

COPPER.—Duty: Pig, Bar and Ingot, 4¢; Old Copper, 2¢ ₩ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	₩ lb	11¾¢ @ 11¾¢
Ingot, Baltimore	"	10¾¢ @ 11 ¢
Ingot Anchor	"	10¾¢ @ 11 ¢
Braziers' Copper, ordinary sizes, 16 oz. ₩ sq. ft. and over		@ 17 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ₩ sq. ft.	"	@ 18 ¢
Braziers' Copper, 10 oz. and 12 oz. ₩ sq. ft.	"	@ 20 ¢
Lighter than 10 oz. ₩ sq. ft.	"	@ 22 ¢
Circles less than 84 in. in diam.	"	@ 20 ¢
84 in. diam. and over	"	@ 33 ¢
Segment and Pattern Sheets		@ 20 ¢
Locomotive Fire-Box Sheets		@ 19 ¢
Sheathing Copper, over 12 oz. ₩ sq. ft.	"	@ 16 ¢
Bolt Copper	"	@ 18 ¢
Copper Bottoms	"	@ 18 ¢
Nickel Plated Sheathing	"	@ 35 ¢
" " " for boilers	"	@ 37 ¢
Plating extra	" 25 ¢	@ 37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	"	@ 21 ¢

Tinning.

14x48, by the case	₩ sheet, 8¢
4x48, less than case	" 8¢
For tinning both sides, double the above amount.	

O'Neill's Patent Planished Copper.—Net.

14x48

14 and 16 oz. and heavier	33¢ By the case. ₩ lb 29¢
12 oz. and lighter	33¢ " " " 32¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.

14 and 16 oz. and heavier	32¢ By the case. ₩ lb 31¢

(And all sizes not over 20 in. wide.)
24x48 and 30x60.

14 and 16 oz. and heavier	₩ lb 34¢
12 oz.	" 37¢

Copper Wire.—(*See Wire.*)

Sheathing Metal.

Yellow Sheathing Metal, ₩ lb ..... 20 @ ....

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884 ..... dis. 20 @ 30 %

LEAD.—Duty: Pig, $2 ₩ 100 lb; Old Lead, 2¢ ₩ lb; Pipe and Sheet, 3¢ ₩ lb.

American	4½¢ @ 4¾¢
Bar	4¾¢ @ 5 ¢
Pipe	6¢, dis 20 %
Block Tin Pipe	40¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	7¢, dis 20 %
Shot	Drop, 6¢; Buck, 7¢
Chilled Shot	7¢

ANTIMONY.

Hallett's	₩ lb 9¼ @ 9¾ ¢
Cookson	" 9¾ @ 10¼¢

SPELTER—Duty: Pigs, Bars and Plates, $1.50 ₩ 100 lbs.

American, cash	4⅝ ¢ @ 5¢
Bergenport	9¢

ZINC—Duty: Pig or Block, $1.50 ₩ 100 lbs. Sheet, 2½¢ ₩ lb.

600 lb casks	5.80 @ 6.00¢
Zinc.—Open	6.50 @ 7¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	₩ lb 6½ @ 7¢
X	.10¢
X X	.15¢
J. B	.20¢

WIRE.

Market Wire.—Put up in 68 lb bundles.

Nos. 00 to 9,	10,	11,	12,	13, 14,	15, 16,	17,	18.
	10	11	11½	12½	14	15	16
Bright Market Wire							dis 70 %
" Charcoal							dis 50 %
" Bale Wire, Nos. 7 to 12							dis 65 %
Annealed Market Wire							
" Fence Wire, Nos. 8 and 9							dis 70 %
" Grape Wire, Nos. 10 to 14							
Coppered Market Wire							dis. 65 %
" Bale Wire, Nos. 7 to 12							dis. 60 %
Galvanized Market Wire							dis 60 %
" Fence Wire							

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 70 @	70 %
19 to 26		70 %
27 to 36	" 75 @	75 %
Galvanized Stone Wire	"	50 %

Steel Wire.

Cast Steel, Steel Wire list ..... dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 30 @ 30.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.30
" 36	.76	.80	1.50
" 37	1.00	1.04	1.70
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance. Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ⅓ Warranted	14½ @ ¢
Extra	13½¢
No. 1 Refined	11½ @ 12 ¢
No. 2 "	11¼ @ 11½¢
Extra wiping	11¼ @ 11½¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 50 %
In bulk, new list, Dec. 10, 1881	dis. 50 %
Copper Rivets and Burrs	dis. 50&10@60 %

Nos..	7	8	9	10	11	12	13	14	15
₩ lb..	49¢	50¢	53¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 65 %
R. B. & W	dis.
R. & E. Mfg. Co	dis. 70 %

FRENCH GLASS.

August 20, 1885. Per Box, 50 feet.

Single Thick.

Sizes.	1st. E F H	2d. I E H	3d. H H	4th. H B
25 6 x 8 to 10 x 15	$11.50	$10.50	$10.00	$9.50
40 11 x 14 to 16 x 24	18.00	12.25	11.50	10.75
50 18 x 22 to 20 x 30	17.00	16.00	14.50	13.25
54 15 x 36 to 24 x 30	19.00	17.00	15.00	
60 26 x 28 to 24 x 36	20.00	18.50	16.25	
70 26 x 36 to 26 x 44	21.50	20.00	16.50	
80 26 x 46 to 30 x 50	23 50	22.00	19.00	
84 30 x 52 to 30 x 54	25.00	23.00	20.00	
90 30 x 56 to 34 x 56	26.00	24.00	22.00	
94 34 x 58 to 34 x 60	27.50	26.00	23.50	
100 36 x 60 to 40 x 60	31.00	28.00	26.00	

Double Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$14.00	$13.50	$13.00	$12.25
40 11 x 14 to 16 x 24	17.00	16.00	15.25	14.50
50 18 x 22 to 20 x 30	22.00	20 50	19.00	
54 15 x 36 to 24 x 30	24.00	22.00	20.00	
60 26 x 28 to 24 x 36	26.00	24.00	21.75	
70 26 x 36 to 26 x 44	27.50	26.00	22.50	
80 26 x 46 to 30 x 50	30.00	28.00	24.50	
84 30 x 52 to 30 x 54	31.50	29.00	26.00	
90 30 x 56 to 34 x 56	33.00	30.50	28.00	
94 34 x 58 to 34 x 60	35.00	34.00	31.00	
100 36 x 60 to 40 x 60	38.00	36.00	31.00	

Sizes above—$15 per box extra for every 5 inches. Discount 70&10&5@70&10&10 %.

PAPER STOCK, &c.

(Dealers' Selling Prices.)

	Cents	₩ lb.
White Shirt Cuttings, No. 1	6¾ @	7
" " No. 2	5¼ @	6
Mill Assorted Whites	5 @	5½
Unbleached Muslins	5¾ @	6
City Whites No. 1	4¼ @	4⅝
City Whites, No. 2	3⅝ @	3⅞
New Canton Flannels	5 @	5⅛
New Seconds, light	3¾ @	4
" dark	3 @	3¼
Cotton Canvas	4½ @	4⅝
Linen Canvas No. 1	4 @	4¼
Seconds, City No. 1	1⅜ @	1½
Seconds, City No. 2	1 @	1¼
Colors, ₩ cwt	40 @	60
Manilla Rope	3 @	3½
" Tarred	2½ @	2⅝
Gunny Bagging, No. 1	1⅝ @	1⅞
" No. 2	1½ @	1⅝
Kentucky Bagging	4 @	....
Burlap Bagging, No. 1	2 @	2¼
Tar Shakings	1⅝ @	2
Hemp Twine Stock	3½ @	3⅝
Hard White Shavings, No. 1	3½ @	4
Soft White Shavings, No. 1	3 @	3¼
White Shavings, No. 2, Soft	2½ @	2¾
Mixed Shavings, part White	2¼ @	2½
Ledger and Writing	2½ @	2¾
Solid Stock	2½ @	2¾
Book Stock, No 1, light	1 @	1½
Old Newspapers	1¼ @	1½
Pure Manillas	1¾ @	....
Bagging Manillas and Hardwares, cwt	60 @	100
Commons, ₩ 100 lb	40 @	60
Binders' Board Cuttings	½ @	⅝
Straw Board Cuttings, ₩ cwt	60 @	70

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	₩ lb 22 @ 24¢
" Ordinary	6¢
Black Ivory Drop, fair	12 @ 16¢
" " best	22¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1¼¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7¢
Green Chrome	15 @ 23¢
" " in oil	14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢
" " in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	₩ lb 2¼¢
" Brown	" 1½¢
" Purple	" 2¢
" Ground in oil, Bright Red	" 6½¢
" " " Red	" 5½¢
" " " Brown	" 5½¢
" " " Purple	" 6¢
Litharge	6½¢
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead American	6½¢
" Venetian (Eng.) dry	$1.65 @ $1.70
" " in oil	asst'd cans, 11¢; kegs, 9¢
" Indian Dry	9 @ 12¢
Rose Pink	10 @ 13
Sienna, American Raw, powdered	4¢
" Burnt, powdered	4½¢
" " in oil	10 @ 16 @ 20¢
" Raw	11 @ 15 @ 25¢
Umber, Burnt, powdered	4 @ 8¢
" " in oil	9 @ 12 @ 15¢
" Raw, powdered	4 @ 7½¢
" " in oil	9 @ 12 @ 15¢
Vermilion, Chinese	90¢
" English	53 @ 58¢
" American, Common	15¢
White Lead, American, pure dry	6¢
" " " in oil	6¼ @ 6½¢
White Paris, English Prime	2 @ 2½¢
Yellow Ochre, French	$1.75
" " in oil	asst'd cans, 11¢; kegs, 8¢
" Vermont	in casks, 1½¢
Yellow Chrome	17 @ 27¢
" in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	5 @ 6¢
" No. 1, in oil	9¢
" French (Paris Dry)	5½ @ 7½¢
" in oil	10 @ 11¢

Oils.

Bleached Whale, ₩ gal	55 @ 58¢
" Sperm	$1.00
" Elephant	68¢
Drilling	40¢
B. & R. Best Valvone Cylinder	70¢
Engine	50¢
Fish Oil, Pressed	32 @ 54¢
Lard, Prime Winter	58¢
" No. 1 Extra	52¢
Linseed, Raw in casks and bbls	48 @ 49¢
" Boiled, " "	51 @ 52¢
" Western, " "	44 @ 45¢
Calcutta	49 @ 50
Machinery	40¢
Miners' Oil	35 @ 45¢
Neatsfoot	60 @ 70¢
Signal	50¢
Tallow	58¢
West Virginia	11 @ 18¢

Sundries.

Asphaltum, Cuban, ₩ lb	6½ @ 9½¢
" Trinidad Refined	₩ ton, $27.80
Benzine	₩ gal. 8½ @ 9½¢
Chalk	½ @ 1¢
" Block	¾¢
Crucibles No. 14 and upward, per number	3½¢
Emery 300 lb kegs	4¢
" less than 300 lb	6¢
Frostings	40¢
Glue, White	34 ₩ 35¢
" Sheet	20¢
Glaziers' Points, Zinc, ₩ box	$5.00
Gum, Copal	36¢
" Damar	25¢
" Shellac, English	30¢
" " dark	25¢
Mineral Wool, ordinary, ₩ lb	1 @ 1¼¢
" " extra	3 @ 3½¢
Pumice Stone, selected Lumps	4 @ 6¢
" " powdered	2¾ @ 3½
Pine Tar, bbls	$2.37½
Pitch	$1.60 @ $1.70
Plumbago E. I. Po., ₩ lb	4 @ 6¢
" American, ₩ lb	6 @ 10¢
" Gun Powder Glazing, ₩ lb	10¢
" Shot Polish ₩ lb	10¢
Putty, in bladders	2½¢
" in bulk	1¾ @ 2
Rosin—Common and Good—Strained	$1.35
" E & F	$1.47 @ $1.02½
" G & H	$1.70 @ $1.05
" I & K	$2.85 @ $3.25
" M & N	$3.85 @ $4.05
Spirits Turpentine, ₩ bbl	36¢
Stove Polish, Dixon's	₩ gross $5.50
" Rising Sun	" 5.50
" Gem	" 4.00
" Jet Black	" 3.00
Waste, No. 1 Cop	9¢
" No. 1 White Machine	9¢
" No. 2 White Machine	8½¢
" No. 1 Colored	6½¢
" No. 2 Colored	6¢
" Washed Machine	8½¢
Whiting, Spanish	¾¢

INDUSTRIAL ITEMS.

MAINE.

The new Katahdin Furnace will be blown in about November 1. The capacity will be from 20 to 25 tons a day.

NEW HAMPSHIRE.

George A. Rollins & Co., builders of the Rollins automatic cut-off steam engine, at Nashua, are running their shops on full time and with their full quota of help.

MASSACHUSETTS.

Lanesboro' Furnace and one of the Richmond furnaces will go into blast shortly.

Operations at the Fall River Iron Works have been entirely suspended for some weeks, but work was resumed at the "east end" last week. The employees, on entering, found a notice that all hands would be required to remain in the mill until the regular hour of closing, instead of leaving for home a half-hour or so earlier, as the day's work of each individual was completed, which has been the custom. Quite a number of the help were offended by the notice, and left the mill, but they shortly returned and went to work. The entire works and the nail mill were in operation on Tuesday.

The Eldredge Mfg. Co., Chicopee, have recently been incorporated, with a capital stock of $100,000, under the laws of the State of Illinois, with their headquarters at Chicago. The officers of the company are B. Eldredge, president and treasurer; F. P. Eldredge, vice-president, and Philip Goetz, secretary. The new company have bought of the Ames Co. all the rights, the machinery and tools of the old Eldredge Sewing Machine Co., and will continue the manufacture of the machines. The machines will be manufactured at the Ames Co.'s shop for the present, and work is to be begun at once.

The Whitin Machine Works, Whitinsville, are running by steam on account of low water.

The molders employed in Smith & Anthony's extensive stove foundry, in Wakefield, to the number of 100, refused to go to work on Monday unless the firm gave them an increase of 15 per cent. on the present wages. The superintendent promised to lay the matter before the directors. The molders then left the foundry, and returned to their homes. It is understood that the foundry will not have to shut down on account of the action of the molders, but will be run as usual.

We learn that Mr. Roland T. Oakes, formerly connected with the Ames Co., of Chicopee, is now general manager of the Amhurst Hydraulic Motor Co., at Holyoke.

Beaudry & Cunningham, of Boston, have recently placed a 200-pound Beaudry upright hammer for drop-forging of flyers in the works of Benj. Buckley's Sons, at Paterson, N. J. This, it is said, is the only hammer that will do this work.

CONNECTICUT.

The E. Horton & Son Co., Windsor Locks, have received an order for a chuck which will be, when made, the largest in the world. It is for holding large engine driving-wheels, and will be made with two complete sets of gearing and six jaws.

The Humphreysville Mfg. Co., of Seymour, have commenced running their auger and bit shop by steam, and will continue to do so while the new water-wheel is being put in.

The Hunts-Lyman Furnace will blow in about October 15.

The Eddy Electric Mfg. Co., of Hartford, Conn., succeed A. H. Eddy, as manufacturers of the Mather dynamo-electric machines for electrotying, electroplating, the reduction of ores, &c. The demand has necessitated increased facilities for the production of these dynamos.

NEW YORK.

The Crown Point Furnaces are both in blast. They have no iron on hand, having sold 10,000 tons at $1 a ton higher price than the iron brought last January. The furnaces run on Bessemer pig.

Application was made on September 29 for the appointment of a receiver for the Parrott Iron Co., whose affairs will probably thus be wound up.

PENNSYLVANIA.

One of the Spearman Furnaces, at Sharon, will blow in next week.

The statement that Robert Hare Powel's Sons & Co. have discharged all the Hungarian laborers employed at their Powelton Furnace, in Bedford County, is denied by them. They discharged a few, owing to a threatened strike, but will probably replace them with others.

The Western File Works, of Beaver Falls, will start up next week.

The Etna Nail Mill, at New Castle, owned by P. L. Kimberly, which has been idle for some months, will be started up this week.

The enlarged Robesonia Furnace will probably be put in blast in three weeks.

The Montgomery Furnace, at Port Kennedy, is out of blast, having chilled September 23.

The Hooven Pipe and Rolling Mill was started up September 21.

Ground has been staked off for a new forge to be erected west of Light's Rolling Mill, Lebanon, by Samuel Light.

The Lebanon Iron Co., of Lebanon, are overrun with orders, and will soon commence running double turn.

The Lehigh Zinc Co., of South Bethlehem, contemplate building 24 new oxide furnaces, which will give employment to an increased number of men. Work will be commenced at once on the improvements.

The new pipe mill at Scottdale is assuming shape. The pattern shop is up and the large frame of the main building will be in place this week. The contracts for the steam crane and two steam boilers, 28 feet long and 42 inches in diameter, have been let, and a new track has been laid into the mill for convenience in loading.

The sale of the real estate belonging to the Wheeler Iron Co., at Middlesex, has been postponed until the January term of court, and it is given out by those in a position to know that all will be in *statu quo* by that time. The work of repairing Fannie Furnace is being pushed by a large force of workmen, and before 30 days she will be in all her pristine glory.

No. 2 of the Colebrook Furnaces, at Lebanon, which had been out of blast for several weeks, was blown in on Saturday last.

The usual semi-occasional rumors about starting up the Wheatland Iron Works, establishing a pipe works there, building steel works, and other similar reports, have been circulated for the past few days. The Woods heirs are credited with being the parties who are going to do these things, but the millennium will probably arrive in the meantime.—*Sharon Herald.*

The Dunmore Iron and Steel Co. have been chartered, and will do business at Dunmore, Lackawanna County. The capital is $500,000.

There is a rumor on the streets that Boone's Iron Mill has been sold to a party in Elmira, N. Y., and that a prominent iron man of Norristown will be put at the head of the concern to run it.—*Norristown Times.*

Concord Axle Co., Penacook, N. H., are putting in a new and larger water-wheel and new machinery in several departments of their works. They report trade fair and increasing.

PITTSBURGH AND VICINITY.

By the explosion on last Friday of the mud-drum attached to a battery of boilers in the Solar Iron Mill of Wm. Clark & Co., seven workmen were fatally, and a large number seriously, injured. The explosion occurred just as the night turn was leaving the mill; otherwise, the loss of life must have been much greater. The cause of the accident was corrosion of the drum by the water used,

The Keystone Bridge Co. have received a contract for the construction of an iron bridge across the Licking River, between Newport and Covington, Ky. The bridge will be two spans of 267 feet each.

During the month of September Oliver Brothers & Phillips made 6505 tons of finished iron and steel. A large part of this was consumed by their factories and the rest was shipped as fast as made.

The Marshall Foundry and Construction Co., of Pittsburgh, were the lowest bidders for the ironwork on the roof of the public building at Peoria, Ill. Their bid was $12,651.

OHIO.

But three of the 14 furnaces in the Hocking Valley are in blast—the Akron, Baird and Winona. One stack at the Fannie Furnaces will blow in in the next fortnight, and the Bessie soon.

The Acme Cold-Polishing Shafting Works, owned by the Mahoning Valley Iron Co., Youngstown, and located near the mills, burned to the ground on October 4. The blaze broke out, it is supposed, from a lamp exploding. The company had a large number of orders on hand, and the works were operated to their full capacity. The loss will amount to $10,000. Insured for $4200. The company will rebuild at once.

The new Cartwright Iron Co., operating the old mill at Alikanna, just above Steubenville, started up with 60 men on September 22.

One of the Cherry Valley furnaces, at Leetonia, will blow in this week. Both stacks have been out for some time.

The new mill of the Falcon Iron and Nail Co., at Niles, will be ready to start in about two weeks.

The Champion Iron Fence Co., of Kenton, have recently been increasing their facilities by the addition of two fine punching and shearing machines made by the Long & Alstatter Co., of Hamilton, and the putting in of all necessary machinery and skilled labor for turning out jailwork according to the most approved modern plans. The company report that they have now shipped nine of an order for 24 carloads of fencing to parties in Buffalo.

ILLINOIS.

The works of J. P. Marsh & Co., Chicago, are running day and night on orders for Marsh's patent air-valves and ammonia-gauges, a single order for 100 of the latter being on the books of the firm. The recent shipments of this house include a lot of pyrometer gauges to New Zealand, and a second lot is being made ready for delivery to the Fairbanks Canning Co., Chicago.

The contract for the ironwork for the State House at Springfield has been let to H. A. Streeter, proprietor of the Globe Iron Works, Chicago, at $27,886.51, less $3512.83 for stylobate iron, which is conditional.

There is being built at the Chicago Die and Machine Works a new file-cutting machine, the patent for which has just been issued to H. F. W. Liebmann, of Chicago. In this machine the file-blank rests on a platform or table, the chisel is brought down to the file and given a blow by the hammer, and this process is repeated automatically, the chisel and hammer being raised sufficiently. The movement is by hand.

Klinefelter & Dillman, of Joliet, report a large number of orders for their new combined corn-planter and check-rower.

A new steel-casting plant will soon be started in Chicago. The interested parties are W. S. Brewster, Arthur Pierce and others. The works will be known as the Riverside Steel Casting Co., and will have a capital of $200,000.

WISCONSIN.

The Northwestern Furnace will blow out shortly.

INDIANA.

The Vigo Furnace will blow in at an early date.

The Jeffersonville Plate-Glass Works assigned on September 29, and the 150 employees were notified that the works would shut down at once. Liabilities not known, but said to be largely in excess of the assets. The institution has been losing money, and the failure is said to be due to the inability to compete with other manufacturers who use gas instead of coal for fuel.

The Indianapolis Car Mfg. Co. have resumed operations. They are now filling a small contract for 40 cars. They have every prospect of continued business, and the shops that have long been idle are now a busy scene.

The Indianapolis Foundry Co. are a corporation that all parties concerned in may justly be proud of. They are the old Indiana Foundry Co. re-organized by practical men, and now stand to the front in general foundry-work. Their work is of the best, their credit is high, and they are indorsed by the best men in town.

Sinker, Davis & Co., Indianapolis, are having an unusually good business in boilers, engines and general machinery.

The Indianapolis Machine and Bolt Co. are very busy manufacturing their celebrated Fulton steel pulleys and bench-anvils. They also make a pulley with cast hub, arms and rim, and then a steel band. The cast part of this pulley being made of the best charcoal iron and the band of steel, they offer it as a piece of work almost indestructible and within the reach of all machinists.

MISSOURI.

As was reported, the Shickle, Harrison & Howard Iron Co., of St. Louis, have received a contract for cast-iron pipe aggregating about 6 miles of all sizes, for the Abilene (Tex.) Water Works. They have also taken a pipe contract of similar proportions for the proposed new water works at Paola, Kan., including the stand tower besides. At Houston, Tex., they will put up a mammoth steel water tower, to be, when completed, 30 feet in diameter and 150 feet high.

"C" Furnace of the Vulcan Steel Works, operated by the Western Steel Co. is now producing about 100 tons of iron a day. In the steel-making departments operations will probably begin in about two weeks.

A large order was placed last week by the Wrought-Iron Range Co., of St. Louis, with the St. Louis Stamping Co. The order calls for 1000 tons, or 2,000,000 pounds, of cold-rolled plates, and was awarded to the home firm in competition with a Pittsburgh bidder.

ARKANSAS.

The Keystone Manganese and Iron Co., of Johnstown, Pa., have just been chartered. The directors are James McMilton, P. E. Chapin, C. P. Sellis and John Fulton, of Johnstown; Theodore C. Bates, of Worcester, Mass; J. King McLanahan, of Hollidaysburg, and George W. Gregory, of Boston. The company have been organized to work manganese mines in Arkansas. The capital stock is $500,000.

MARYLAND.

But three furnaces are in blast in Maryland, all charcoal. The stocks of pig iron are quite light.

TENNESSEE.

One of the South Pittsburgh furnaces has gone out for repairs.

ALABAMA.

The Birmingham *Chronicle* says that the English capitalists who recently invested largely in mineral lands in Talladega County have shipped a plant for a furnace to be erected on these lands. The same plant was recently blown out in England, so its coming to Alabama is regarded as especially significant.

It is said, on respectable authority, that the purchase made some two weeks ago by an English syndicate of 50,000 acres of coal and iron lands in West Alabama means, as one of the first results, a railroad northward from Tuscaloosa, which is at the head of navigation on the Warrior River, through those lands to the Georgia Pacific road.

The Pennsylvania and Mobile Coal Co. have been organized at Mobile, and have put $100,000, according to newspaper reports, into Walker County coal lands. Gen. R. Coutter, president of a national bank at Greensburg, Pa., is president of the company.

There is promise of boiler works at Birmingham.

A stubbornly-contested lawsuit was decided at Birmingham on the 1st by a verdict for $15,000 damages in favor of the Woodward Iron Co., of Wheeling, near the former place, against Witherow & Gordon, the late Pittsburgh firm, widely known as furnace builders. The ground of the suit was alleged defective construction of three Whitwell stoves and a chimney, completed by defendants for plaintiffs in the winter of 1882–83. In the fall of 1883 the brickwork began falling out, and the necessity of fixing the blame for this made the case very complicated. The complaint originally asked for $15,000, but when the case came to trial it was amended so as to read $40,000, to cover damages, which, it is claimed, have resulted since the suit was brought. The case engaged the Birmingham City Court for 14 days, and now goes to the State Supreme Court on appeal.

There is a promising movement for a narrow-gauge railroad from Montgomery to Hogneville, the county seat of Lowndes.

The city government of Montgomery is receiving proposals to build water works.

Birmingham is to have bridge works, with W. L. Shideler, from the Champion Bridge Co., of Wilmington, Ohio, a stockholder and manager.

The new plate and sheet mill of the Birmingham Rolling Mills was put in operation a few days ago. It rolls some 6 tons of stove-pipe iron a day.

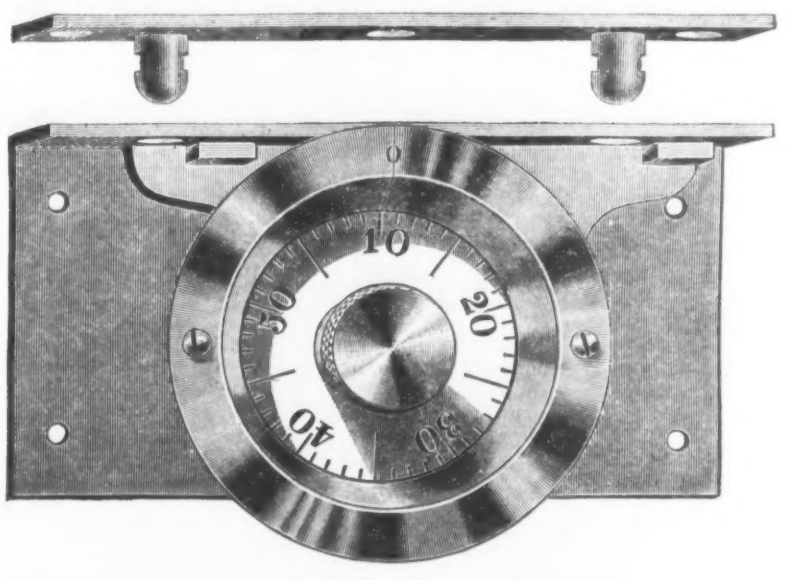
KENTUCKY.

Mr. G. A. Millard, well and favorably known as a pig-iron salesman, has made an engagement with Geo. S. Moore & Co., Louisville.

HARDWARE NOVELTIES.

Improvement in Combination Chest Locks.

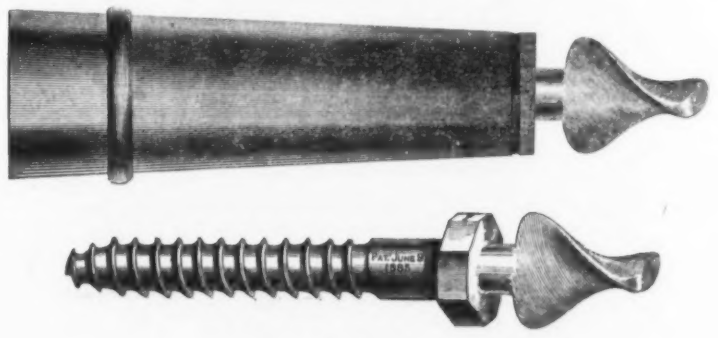
The Miller Lock Co., Philadelphia, Pa., have recently made an improvement in their Chest Locks, which is represented in the accompanying illustration, showing that the knob is made flush with the woodwork of the chest, and is thus protected from injury when in use or in transit. This flush dial will also be available for the locks adapted to drawers, closets and desks as well as to those for chests. The manufacturers will continue to make beveled dials as before. The flush dials, as the others, are nickel-plated, and the locks are packed with directions and screws complete.



Flush Dial Combination Chest Lock.

The Perfection Whiffletree Tip.

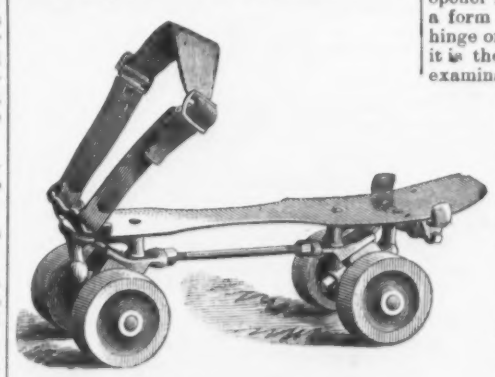
The accompanying illustrations represent this article, which is manufactured by C. L. Bellamy & Co., Newark, N. J., for whom Sise, Gibson & Co. are agents, 100 Chambers street, New York. It is made under a recent patent, and requires little explanation. The peculiar spiral-shaped tip is referred to as passing through a flat hole in the trace without enlarging the opening, thus avoiding stretching and tearing at the end, as in the old-fashioned tip. The ease with which the trace can be put on and taken off instantly by a slight movement of the hand near the end is also alluded to, as well as its security, since it is not liable to be shaken or thrown off by any movement of the horse.



The Perfection Whiffletree Tip.

The Eclipse Roller Skate.

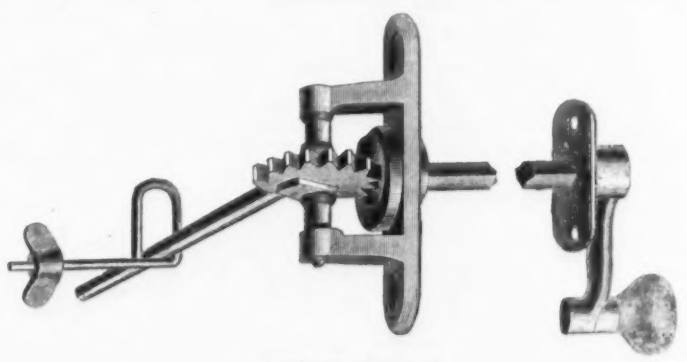
Doty's Patent Eclipse Roller Skate, illustrated herewith, is manufactured by the Columbus Roller Skate Co., Columbus, Ohio. The principal feature of this skate is that its axis of lateral motion is suspended by means of a ball-and-socket bearing at one end and a pivot bearing at the other, which the manufacturers refer to as a construction with little liability to wear, and at the same time affording an easy and free movement. The cushion is entirely out of sight, being incased in a pressure-box which protects it from being cut or from being corroded by the oil. The tension may be regulated without removing the skate from the foot. The axles, screws and foot-plates are of steel. All parts made interchangeable and the trucks can be readily detached for the purpose of putting in new rubbers when necessary or for cleaning. The finish also is referred to, the best grade being described as highly polished and nickel plated.



The Eclipse Roller Skate.

Pratt's Blind Opener.

The engraving below illustrates an article now being offered by the Millers Falls Co., of 74 Chambers street, New York. It is adapted to opening and shutting blinds without raising the window sash. The makers state that in its present form it is the result of long experiments with different kinds of Blind Openers. Its special advantage over others is that it is applicable to any blind without change of hinges. The plate to which the crank is shown attached is secured to the inside casing of the window, while the second and larger plate, upon which the ratchet-wheel is shown in place, is secured to the outside casing. The wire loop to which the thumb-screw is attached is inserted in the rail of the blind, and is fastened in place by the screw. The arm extending from the ratchet-wheel passes through the loop, as represented in the engraving, and moves the shutter as the wheel is turned. Whatever the hinges may be on the blinds, they are not disturbed. The loop shown in the engraving may be replaced by a screw-eye or wire staple placed in the rail of the blind, and the lever works in this as well as in the special fixture shown in the cut. The opener locks the blind fast at any point it may be when the crank is released. Another style of blind opener made by the same company is of such a form as to occupy the place of the lower hinge on the blind. In its general features it is the same as shown in the cut. A close examination of the engraving will show the great leverage which this form of construction possesses. The wheel or disk on the end of the shaft which goes through the casing or frame is so grooved as to mesh with the teeth of the disk that forms the end of the lever or arm. There is little or no lost motion, and the action is positive at every point.



Pratt's Blind Opener.

An appliance for drying and superheating steam has been devised of multitubular boilers by Max Gehre, of Hanover. As superheaters in the fire-box act unequally and are liable to great strain, the Gehre apparatus is placed in the smoke-box. The apparatus itself is traversed by tubes forming a continuation of those in the boiler, but of rather larger diameter. The steam is thus superheated by contact with the sides of the tubes and of the chest, which are continuously heated by the products of combustion.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Oct. 7, 1885:

Hardware.

Baldwin Bros. & Co.
Gun barrels, cs., 6
Barbour Bros. & Co.
Machinery, pkgs., 15
Bellamy J. & Co.
Case, 1
Boker Hermann & Co.
Hdw., cutlery and guns, pkgs., 114
Curley J. & Bro.
Mdse., case, 1
Downing R. F. & Co.
Ironware, cs., 12
Drexel, Morgan & Co.
Arms, cs., 16
Edmiston & Lapham,
Machinery, cs., 2
Field Alfred & Co.
Mdse., cs., 26
Folsom H. & D.
Guns, cs., 10
Gerdan Otto,
Bundles, 221
Bales, 2
Graef Cutlery Co.
Cutlery, cs., 3
Godfrey C. J.
Arms, cs., 4
Gt. West. Disp. Co.
Case, 1
Hartley & Graham,
Arms, cs., 6
Hart A. H. & Co.
Machinery, cs., 3
Knauth, Nachod & Co.
Ironware, pkgs. 29
Lamberson, Turman & Co.
Guns, cs., 5
Lindemann O. & Co.
Cases, 3
McCoy & Sanders,
Chains, cks., 18
Hdw. and cutlery, cs., 3
Merch. Disp. Co.
Ironware, case, 1
Arms, cs., 8
Moore's Sons J. P.
Arms, cs., 15
Remson Wm.
Machinery, cs., 7
Mach'y, pkgs., 2
Rotterdam S. S. Co.
Arms, cs., 20
Schoverling, Daly & Gales,
Mdse., cs., 14
Arms, cs., 13
Sutro Bros.
Machinery, case, 1
Wiebusch, Hilger & Co.
Gun worms, case, 1
Files, cask, 1
Witte John G. & Bro.
Cutlery, cs., 6
Windmuller L. & Roelker,
Guns, cs., 6
Order,
Files, cks., 40
Ironware, pkgs., 28
Ironware, cks., 2
Anvils, pkgs., 14
Guns, 26
Cases, 2

Iron.

Baring Bros. & Co.
Bars, 2330
Nail rods, coils, 60
Wire rods, coils, 1794
Brown Bros. & Co.
Wire rods, coils, 1579
Cortis R. J.
Wire rope, coil, 1
Crocker Bros.
Spiegel, tons, 309
Ferro iron, cks., 28
Downing G. F. & Co.
Pig, tons, 300
Girders, 856
Bundles, 81
Greeley E. S. & Co.
Galv. wire, coils, 451
Lillienberg N.
Nail rods, bdls., 118
Lundberg Gust.
Bundles, 633
Bars, 11,198
Merch. Disp. Co.
Wire, bdls., 140
Morton, Bliss & Co.
Beams, 84
Naylor & Co.
Bars, 24,656
Rods, pkgs., 36,769
Overton & Co.
Ironwork, cs., 6
Plock & Co.
Wire rods, coils, 193
Winn & Holland,
Pig, tons, 50
Order,
Pig, tons, 100
Ore, bbls., 109
Rings, 8
Fish plates, bdls., 250
Wire rods, bdls., 300
Connecting rod, 1
Spiegel, kg., 254,000
Fence wire rods, pkgs., 2468
Sheets, pkgs., 1934

Steel.

Baring Bros. & Co.
Wire rods, coils, 4950
Cary & Moen,
Bundles, 154
Meyer, Strouse & Co.
Casks, 49
Cases, 3
Meissner, Ackerman & Co.
Wire, coils, 739
Merch. Disp. Co.
Steelware, case, 1
Morton, Bliss & Co.
Sheets, cs., 4
Naylor, Benzon & Co.
Rods, bdls., 8885
Billets, pcs., 65
Naylor & Co.
Rods, bdls., 4973
Pilditch F. S.
Bundles, 87
Cases, 5
Temple & Lockwood,
Bundles, 16
Bars, 12
Wagner W. F.
Bundles, 178
Bars, 29
Cases, 31
Plates, 14
Order,
Old springs, tons, 50
Rods, bdls., 4246
Forgings, 23
Wire, coils, 54
Bands, 202
Bars, 74
Bundles, 111
Rails, 1626

Metals.

Alexandre F. & Sons,
Tin plates, bxs., 80
Baring Bros. & Co.
Tin plates, bxs., 287
Blake & Co.
Plumbago, bbls., 659
Bruce & Cook,
Tin plates, bxs., 1475
Canadian Bank of Commerce.
Tin plates, bxs., 550
City Button Works,
Zinc plates, cs., 8
Coddington T. B. & Co.
Tin plates, bxs., 194
Cort N. L. & Co.
Tin plates, bxs., 662
Demilt H. R. & Co.
Tin plates, bxs., 160
Dickerson, Van Dusen & Co.
Tin plates, bxs., 3863
Fedde Gabriel,
Fog horns, cs., 2
Gould Robert S.
Brass foundry, cs., 8
Junge F. W. & Co.
Mdse., cs., 12
Knauth, Nachod & Co.
Brassware, case, 1
Merrick C. S. & Co.
Tin plates, bxs., 220
Meyer G. A. & E.
Zinc oxide, bbls., 100
Morton, Bliss & Co.
Tinfoil, cs., 6
Naylor & Co.
Tin plates, bxs., 4695
Tin slabs, 1149
Phelps, Dodge & Co.
Tin plts., bxs., 12,061
Willett & Hamlin,
Y. m. sheathing, cs., 50
Order,
Quicksilver, bottles, 200
Tin ingots, 600
Tin plates, bxs., 14,238
Tin and terne plates, bxs., 194
Tin slabs, 1018

The imports at this port of Hardware, Cutlery and Metals for the week ending October 2 are as follows:

	Quantity.	Value.
Anvils	148	$1,392
Brass goods	54	5,384
Bismuth	4	2,024
Bronzes	22	2,456
Chains and anchors	41	1,637
Clocks	54	4,461
Cutlery	143	39,945
Guns	123	21,765
Hardware	5	246
Iron, pig, tons	989	14,692
Iron, sheet, tons	295	29,784
Iron cotton ties	8,800	6,150
Iron, other, tons	1,152	45,806
Machinery	143	11,272
Metal goods	363	33,053
Nails	1	1
Needles	10	3,906
Nickel	3	800
Old metal		107
Platina	2	10,169
Plated ware	31	1,216
Percussion caps	10	1,511
Pins	30	3,949
Railroad bars	2,100	1,460
Regulus antimony	67	3,468
Saddlery	29	4,761
Steel	59,091	43,730
Tin, boxes	24,781	106,608
Tin, 3,552 slabs; lb	255,712	64,689
Wire	15	2,161
Zinc oxide	5	145

The following is a comparative statement of the value of metals imported at this port during the third quarter of the last three years:

	1883.	1884.	1885.
Copper and ore	$19,987	$37,340	$26,777
Iron, bars	605,305	750,474	365,639
Iron, pig	1,151,841	737,064	347,163
Iron R. R. bars	5,842		
Iron, sheet	73,703	39,996	62,301
Lead	18,791	26,411	24,764
Spelter	49,720	41,215	20,215
Steel	876,053	879,461	686,684
Tin slabs	1,666,649	1,274,305	1,398,730
Tin plates	3,086,692	2,276,328	1,879,150
Zinc	23,389	27,917	7,065

Exports.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the Port of New York, for the week ending October 6, 1885:

Hamburg.

	Quan.	Val.
Mach'y, pkgs.	48	3,063
Mf. iron, pkgs	7	161
Ag. imp., pkgs	67	1,377
Sew. ma., cs.	874	16,538
Wringers, cs.	25	458
Hdw., cs.	139	2,489
Pumps, pkgs.	2	50
Clocks, cs.	142	2,903
Rifles, cs.	2	390
Copper, casks	18	4,032

Bremen.

Hdw., cases	20	315
Mach'y, pkgs.	6	1,080
Ag. imp., pkg.	1	3

Rotterdam.

	Quan.	Val.
Copper, bars	871	4,800
Ag. imp., pkg	1	25
Copper, casks	371	50,088

Konigsberg.

Mach'y, pkgs.	6	1,000

Glasgow.

Ag. imp., pkgs	25	900
Rifles, case	1	124
Hdw., cs.	19	333
Clocks, pkgs.	132	2,295
Pumps, pkgs.	3	96
Mach'y, pkgs.	4	1,000
Mf. iron, pkg.	1	53
Cartridges, cs.	2	148
Windmills, cs.	42	1,179
Ox. zinc, bbls	40	308
Sew. ma., cs.	361	8,688
Saws, cs.	16	103
Steel pipe, pcs	6	388

Bristol.

Mach'y, pkge	1	775
Clocks, pkgs.	11	472

Liverpool.

Pig iron, tons	207	3,105
Hoop iron, pgs	43	112
Clocks, cs.	274	5,701
Br. g'ds., cs.	20	1,500
Cutlery, cs.	5	1,075
Hdw., cs.	20	357
Firearms, cs.	4	621
Cop. ore, sks.	7,198	35,600
Pumps, pkg.	1	47
Mach'y, pkgs.	47	1,930
Sew. ma. cs.	313	7,364
Mf. iron, pkgs	42	533
Ag. imp., pkgs	604	13,232
Copper, casks	103	12,875

Amsterdam.

Hdw., pkgs.	16	292
Copper, casks	26	5,917
Cop. ware, cs.	3	120
Pumps, pkgs.	12	901
Sew. ma., cs.	205	4,645

Antwerp.

Hdw., cs.	25	809
Firearms, cs.	3	934
Copper, casks	36	4,800
Mach., pkge.	1	1,000
Clocks, pkgs.	6	145
Pumps, pkgs.	4	145

London.

Mach., pkgs.	61	12,310
Rifles, cs.	2	113
Cutlery, case	1	31
Ag. imp., pkgs	2	121
Clocks, pkgs.	250	2,679
Saws, case	1	25
Hdw. pkgs.	377	6,260
Sew. ma., cs.	21	694
Cartridges, cs.	501	10,010
Print'g mach.	1	15,000
Pumps, pkgs.	8	900
Wire, bbl.	1	100

Hull.

Pumps, pkg.	1	70

Havre.

Hdw., cs.	3	375
Copper, casks	80	10,200
Copper, cakes	1089	18,000
Ag. imp., pkgs	53	1,725
Skates, case	1	106

British West Indies.

Clocks, cs.	6	106
Tinware, cs.	9	302
Ag. imp., pkgs.	10	73
Br. g'ds, cs.	2	46
Ag. imp., pkgs	4	60
Saws, case	1	31
Scales, cs.	5	126
Pumps, pkgs.	14	111
Nails, kegs	28	98
Mf. iron, pkgs	9	66
Sew. ma., cs.	9	156
Hdw., cs.	35	484
Cutlery, cs.	2	23
Mach'y, pkgs.	12	430

Canada.

Sht. iron, pkgs	20	299
Rifles, case	1	105
Mach'y, pkge.	1	48
Tin plate, bxs.	90	624

New Zealand.

Nails, cs.	66	1,528
Wire gds., cs.	7	54
Wringers, cs.	63	1,625
Sew. ma., cs.	12	198
Scales, cs.	23	304
Rifles, cs	2	175
Tinware, cs.	5	108
Clocks, cs	40	742
Tacks, cs.	3	29
Hdw., cs.	467	8,685
Mf. iron, pkgs	144	1,867
Ag. imp., pkgs	108	1,736
Pumps, pkgs.	7	344
Nails, kegs	73	184
Saws, cs.	14	405
Mach'y, pkgs.	17	504
Cutlery, cs.	2	35
Bells, case	1	15

Nova Scotia.

Hdw., case	1	3
Tin plates, cs.	6	87
St'p'd ware, cs	3	85

New Brunswick.

Mach'y, pkgs.	20	6,250
Mf. iron, pkgs	2	21

British Australia.

Hdw., pkgs.	2	176

Bordeaux.

Ag. imp., pkgs	17	1,280
Copper, bars	8	100

Cuba.

Mach'y, pkgs.	670	13,220
Rivets, kegs	10	82
Spikes, kegs	1,087	2,412
H'p iron, bdls.	15	32
Tinware, cs.	10	264
Saws, case	1	25
Tinfoil cs.	2	71
Mf. iron, pkgs	239	1,114
Pumps, pkgs.	5	74
Cutlery, cs.	3	90
Wire cloth, cs	6	183
M. dust, bbls.	42	120
Hdw., pkgs.	206	3,212
Scales, cs.	55	897
Br. cloth, case	1	62
Clocks, cs.	4	89
Nails, kegs	564	1,402
Locomotive	1	7,500
Cop. gds., pkgs	1	800
Nails, case	1	124
Br. goods, case	1	75
W. closet	1	30

Chili.

	Quan.	Val.
Ag. imp., pkgs	427	3,716
Saws, cs.	10	251
Iron safe	1	700
Pumps, pkgs.	4	300
Cartridges cs.	7	130
Mach'y, pkgs.	5	550
Mf. iron, pkgs.	603	3,076
Hdw., cs.	173	1,800
Clocks, cs.	11	146
Tacks, cs.	29	125
Revolvers, case	1	195
Nails, kegs	495	1,000
Car wheels	168	1,988
Air brake material, pkgs.	406	30,300

Porto Rico.

Hdw., pkgs.	114	986
Nails, boxes	16	105
Scales, cs.	10	258
Tinware, cs.	9	80
Ag. imp., pkgs.	27	527
Mf. iron, pkgs	215	734
Sew. ma., cs.	12	202
Iron safes	2	500
Mach'y, pkge.	1	135
W. cloth, roll.	1	60
S. zinc, pkgs.	5	135
Nails, kegs	2	20
Br. goods, case	1	25

Mexico.

Hdw., cs.	19	521
Mach'y, pkgs.	60	461
Iron, bars	20	62
Mf. iron, pkgs	117	607
Blowers	2	160
Windmill	1	256
Cartridg's, case	1	85
Sew. ma., cs.	29	527
Tinware, cs.	7	107
Steel, pkgs.	14	264
Wire cloth, cs	3	195
Revolvers, cs.	2	110
Cartridges, cs.	7	203
W. clos., pkgs	7	35

Japan.

Hdw., case	1	50

China.

Air guns, case	1	50
Mach'y, pkge.	1	42

Venezuela.

Mf. iron, pkgs	30	198
Cutlery, cs.	4	176
Scales, cs.	3	50
Tinware, pkgs.	6	58
Hdw., pkgs.	48	705
Mach'y, pkgs.	2	31
Clocks, cs.	6	137
Sew. ma., cs.	3	84
Pumps, pkgs.	10	338
Fountain	1	101
Ag. imp., pkgs	5	140

Brazil.

Scales, cs.	31	177
Iron safe	1	100
Cot. gins, cs.	18	940
Ag. imp., pkgs	40	497
Sew. ma., cs.	82	556
Boilers	2	7,850
Rifles, case	1	45
Cartridges, cs.	16	271
Revolvers, cs.	1	113
Irons, cs.	10	60
Cutlery, cs.	4	451
Hdw., pkgs.	158	1,976
Kitchenware, cases	6	174
Nails, kegs	140	407
Mf. iron, pkgs	9	269
Clocks, cs.	32	524

United States of Colombia.

Hdw., pkgs.	209	3,948
Mf. iron, pkgs	414	2,294
Mach'y, pkgs.	74	1,605
Cutlery, cs.	18	895
Cartridges, cs	5	70
Pumps, pkgs.	8	591
Tinware, cs.	20	891
Nails, kegs	4	27
Turbines	2	540
Rivets, case	1	33
Yellow metal, case	1	38
Wheels and a., pairs	12	81
Bolts, kegs	20	112
Boiler	1	52
Swords, case	1	84
Sew. ma., cs.	124	3,624
Chain, pieces	4	200
Revolvers, cs.	3	603
Firearms, cs.	1	34
Zinc, cks.	15	560
Clocks, cs.	14	208
Iron, pkgs.	64	671
Copper, cs.	2	128
Sawmills	4	425
Ag. imp., pkgs	12	157
Spikes, kegs	120	403

Spanish Possessions in Africa.

Mach'y, pkge.	1	10

San Domingo.

Bells	5	133
Mf. iron, pkgs	5	73
Mach'y, pkgs.	217	2,594
Nails, cs.	6	18
Tin, cases	2	22
Sew. ma., cs.	4	93
Nails, kegs	27	89
Hdw., pkgs.	30	267
Clocks, case	1	21
Copper still	1	341

Hayti.

Nails, kegs	81	213
Clocks, case	1	30
Mf. iron, pkgs.	3	15
Mach'y, pkge.	1	38
Iron, bdls.	8	57

Central America.

Mf. iron, pkgs.	662	3,576
Iron, bdls.	20	179
Nails, kegs	29	98
Shot, bxs.	8	78
Nails, case	1	26
Mach'y, pkge.	1	24
Revolvers, cs.	4	814
Tinware, cs.	2	29
Ag. imp., pkgs.	44	462
Hdw., pkgs.	91	1,505
Sew. ma., cs.	33	696
Zinc, rolls	5	63
Wire gds., pgs	3	33
Cutlery, cs.	19	608
Steel, bdls.	8	79
Cartridges, cs	3	60
Rifles, case	1	50
Iron shoes, pgs	100	655

The Russian Government has just issued a report fixing the subsidies to be granted to the various State aided shipping companies during the ensuing year. First on the list appear the Black Sea Steam Navigation Co., receiving a total sum of £80,353, being at the rate of 2 rubles a mile on 401,761 miles stipulated to be run by the vessels of the corporation. Next follow the Caucasus and Mercury Co., which receive £27,500 for maintaining regular communication between the Russian and Persian ports of the Caspian Sea. Next in importance to this subsidy is that of £25,900 granted to the Amoor Co. for running steamers between the Amoor region and China. Afterward come £5600 allowed to Sheveleff & Co. for regular steamboat communication between Vladivostock and Saghalien, £5000 to Prince Gagarin & Co. for a similar service between the Russian Black Sea ports and towns on the Danube, £3700 to the Kiachta Steamboat Co. in Siberia, and finally £5500 to the Archangel-Mourmain Coast Co. in the White Sea. The total of the seven subsidies is over £150,000, which is irrespective of the pecuniary support granted to the Moscow Volunteer Fleet Committee for running their steamers between Odessa and the principal ports of China and Japan.

Louisville Exposition Notes.

A correspondent writes: Among the foreign exhibits which are interesting is that of Russia. That country makes a large and very fine display of some natural products, but especially of manufactured goods, as glass and glassware, woodenware and a handsome collection of chinaware, both useful and ornamental, all of which is highly decorated, some of the vases standing 4 and 5 feet high and beautifully painted. Several large chandeliers of spun glass are very attractive. Austria and Hungary are represented by a large show of Bohemian glass and jewels of various kinds, particularly garnets. These stones are of all sizes and values, and some are made into exquisite designs. Italy is well represented by statuettes and a perfect display of lava jewelry and the beautiful cameos. There never was seen in this part of the country such a collection of the latter jewels, and thousands of them will be left with the people. China and Japan are well represented in all kinds of silks and fancy work, and their rich villas give a quaintness to the interior of the halls. The Hawaii Islands exhibit numerous crude specimens of undeveloped resources, and a fine collection of seeds and cereals. The United States Government display covers a large space of ground, and is a never-ending source of study to the geologist and one interested in the past nations and peoples of America, whose coming and going is yet to be accounted for. Who the cliff-builders were that constructed such modern-looking dwellings among the mountains as are represented in this display is a problem whose solution is eagerly looked for.

Harvesting machinery is represented by the McCormick, the Empire machines of Akron, Ohio, the Deering machines of Chicago, and W. A. Wood, of Hoosick Falls, N. Y. The Newark Machine Co., of Columbus, Ohio, show a very fine Victor clover huller and several seed drills.

Plows are well represented by the Syracuse Chilled Plow Co., of Syracuse, N. Y., and the Brinley Miles and Hardy Co., Thos. Meikle & Co., and B. F. Avery & Sons, of Louisville. The display of the latter firm is probably the finest and most artistic that was ever made. Each plow stands on a plush cushion; the beams are decorated with hand paintings of landscapes, flowers, birds, fruits, some are of ebony, with the stalks of grain carved, with beads of gold. Their sugar cane cultivator is an implement well worth notice. McCord, Willingham & Williams show a plow attachment or pulverizer which is adjustible to any plow and saves the expense of one harrowing. It pulverizes by a series of knives as the sod turns from the plowshare. Wagons are well represented by the Kentucky Wagon Mfg. Co., in their Old Hickory, and by the Tennessee wagon of Cherry, Morrow & Co., of Nashville, Tenn.

The Faught-Deering Co., of Louisville, have a full list of cotton gins in operation, together with gin gearing and horse-powers. W. T. Pyne, of 1107 Main street, shows various kinds of mills, machinery, &c. The Dow Wire Works have the finest display of wire goods, fencing, railing, &c., in the building.

The annual report of the Bureau of Industries for the Province of Ontario has just been published. The statistics of farm values given by the farmers show a decrease of the value of the lands in the Province from $654,793,025 in 1883 to $624,114,706 in 1882. This decrease is more than half wiped out by an increase in the value of buildings, implements and live stock. The decrease in the value of the land is no doubt due to the continued depression of farm prices. Statistics concerning the wage-earning classes show in general results that the average wages in 504 occupations named is $7.90 per week; that of the workingmen with dependents a little less than half are able to make small savings, a little more than half can just make both ends meet, and about 10 per cent. of the whole earn less than their cost of living. The assessment of the Province per acre has grown from $10.02 in 1872, when values were very high, to $19.19 in 1883, when values were low and on the decline. The average rate of taxation throughout the Province has dropped from 15.9 mills in 1873 to 12 mills in 1883. The rate of taxation in country districts has fallen in the 10 years from 15.7 mills to 9.1 mills.

An automatic regulator of the steam pressure within a boiler has been patented by J. Q. Everson, of Pittsburgh, Pa. A pipe is attached to the safety-valve, and, passing through the stack, enters the flues of the boiler. The pipe should be as large in diameter as the opening in the safety-valve, so that the escape of steam will not be retarded. When the steam pressure exceeds the safety limit it raises the safety-valve and escapes through the pipe into the flues. Thus the steam not only reverses the draft, but forces the gases that are non-supporters of combustion back into the fire. In this way the fire is cooled, the temperature is lowered and the pressure is reduced below the safety limit. The safety-valve then closes, the fire again burns and the hot gases are drawn through the flues into the stack. By the use of this invention an automatic regulation of steam pressure is therefore secured by utilizing the waste steam escaping from the safety-valve. This steam also blows out the soot and keeps the flues clean.

The last "spike" on the Canadian Pacific Railway was driven on the 5th inst., and the line opened for traffic from the east to the heart of British Columbia. The stations along the north shore of Lake Superior are all named; divisional headquarters have been selected, and preparation made to meet any demand on the company's facilities. Although nominally completed, it is not intended to open the line west of the Selkirks for traffic till next May. This step is rendered necessary in consequence of the amount of work still to be done in the way of ballasting, erection of water tanks, station buildings and shops. It has also been deemed prudent to study the action of the snow in the Selkirks at least one winter before commencing operations. The terminal arrangements on the Pacific are yet to be provided.

CONTENTS.

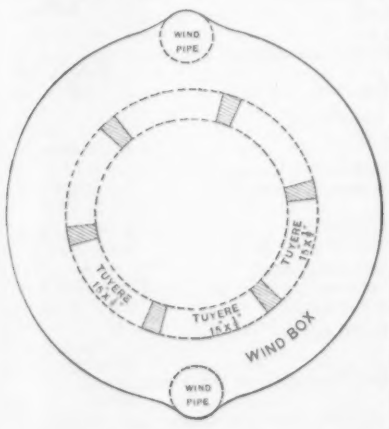
Cost of Production in Foundry Work.

The methods of recording the cost of work produced employed by the Hopson & Chapin Mfg. Co., of New London, Conn., whose establishment we described in a general way in our issue of September 26, have been put at our disposal as the bases of an article on this subject. The business conducted by this concern in many respects resembles that of the stove foundries. It is the production of castings of fine surface and accuracy, and for the most part small pieces are turned out rather than large ones. Unlike many of the stove foundries, however, the castings are made on orders, not as stock to be sold at some future time. Selling prices in many instances are made in competition with the actual cost of other establishments. There is small chance of trade, therefore, unless prices, as compared with ordinary cost of manufacture, are advantageous to the buyer, and there is no opportunity for profit unless the closest economy is enforced in all directions. These conditions, coupled with the fact that the attention of the managers can be devoted wholly to this part of the business, and need not be largely occupied in considering the problem of new and attractive styles in patterns or of disposing of a miscellaneous stock of goods through the instrumentality of traveling salesmen and other machinery of business, requiring for its successful management the best talent that can be commanded, give this establishment an important advantage over the average stove foundry. While the volume of business done by this concern is smaller than that of some of the largest stove companies, the system of accounts that has been devised is capable of indefinite expansion, and for aught we can see, with very slight modifications, might be advantageously adapted to use in any foundry.

The appointments of the foundry of the Hopson & Chapin Mfg. Co., while being well adapted to the business conducted, and of a character to insure economical production, may be characterized as of the simplest kind. There are very few novelties to be discovered in any direction, but old and long-tried means are very generally employed, and in such ways in many cases as to produce new results. The plan of the foundry and its system of railways were given in the general view of the works published in our last issue.

In that article we directed attention to the fact that material could not be taken to the cupola without crossing the scales. We also mentioned that the progress of work in the foundry is from end to end, the general course being such that the work never crosses its own path. This is the key to the management throughout. As iron, coal and coke are conveyed from the stock sheds to the cupola they are weighed and recorded, and as the castings are passed from the tumbling-room to the finishing shop or shipping-room, as the case may be, they are inspected and weighed and also recorded. Labor is likewise recorded with reference to product, so that when returns are made to the general office all the data are at hand to enable the accountant to show results in any form desired.

The cupola in use is of a kind very largely employed in foundries in the eastern portion of the country. A horizontal section through the lower portion of it is shown in the first of the accompanying illustrations. The only important variation from the common type is the arrangement of the tuyeres. These are so placed with respect to the wind-box that an almost continuous opening of small width is secured. The circumference of the cupola is divided into six spaces, with very narrow walls between, each giving a passage of 15 inches or a total of 90 inches for the blast, ½ inch in width. This approaches much nearer to an uninterrupted blast the entire circle of the cupola than is ordinarily attained. The blast is furnished by a Sturtevant blower located on the second floor of the main building (see general plan of works already referred to), and is conveyed to the cupola through a sheet-iron pipe. In this, near the cupola, is placed a gate or valve, and between it and the wind-box there is connected the pipe of a pressure gauge. The pressure gauge is carefully watched during the progress of melting, and the amount of blast regulated accordingly.



Horizontal Section Through Lower Part of Cupola Used in Foundry of The Hopson & Chapin Mfg. Co.

In the manner of recording time, and in the form of foundry report that is employed, more features of novelty will be discovered than in the arrangement of the works and the facilities for manufacture. Time, throughout all departments of the works, is taken by means of tickets, a *fac simile* of one of which, half full size, is shown on this page. The face of this ticket is printed with a series of numbers not unlike in general appearance the duplex tickets that railway conductors are sometimes required to punch in receipt for fares paid them. By punching the figures on these tickets, using for the purpose a conductor's punch, there is recorded the number of the workmen in lieu of their names, the hour at which they commence work in the morning, when they stop for the noon-time intermission, when they again resume work in the afternoon, the hours of work accomplished, the hours at piece work as well as day work, and the hours worked overtime. The back of the ticket is printed with the name of the concern, and is stamped, before issuing, with the date. The tickets used in the foundry proper differ from those used in other parts of the establishment in two particulars. The foundry ticket, as will be noticed by examining the *fac similes* on the opposite page, has the word "heat" under the arrangement of figures in the center space. In other respects the printing on the two is alike. For convenience in distribution the foundry tickets are printed on different colored cardboard from the tickets used in other departments. In foundry work, as our readers know, the day closes with the "heat," and not necessarily at a certain specified hour. Hence to punch the tickets of foundry employees with the hour they left the premises would in many cases seem to indicate short time, when by common consent a full day had been made. Therefore the word "heat" is punched instead.

The tickets are issued in the morning as the workmen enter the premises. The only entrance open is through the office, and, as no time is ever paid for except as recorded upon the tickets, the men are never careless about securing their bits of cardboard. As the tickets are delivered they are punched to read the numbers by which the workmen are known in the works, and also to indicate the hour of commencing work. All those delivered before 7 o'clock, for example, that being the hour of starting the works, would be punched "7" in the right-hand column. Nothing less than 15 minutes is recognized, and accordingly those entering after the whistle blows, and before the time-keeper or foreman has left the office, would have their tickets punched "7.15." Workmen still more tardy are obliged to find the foreman or the superintendent, as the case may be, and obtain tickets as they can before commencing work. The system in this respect has been found to stimulate workmen to punctuality, and it has the good effect of impressing upon the minds of both superintendent and foremen the names of those employees who are the least desirable in this respect. If for any reason a workman is obliged to leave before the regular quitting time, he is similarly obliged to secure the special punching of his ticket, for an incomplete ticket is not honored at the office under any circumstances. At noon the foreman or superintendent again takes his position in the office in the hallway through which the workmen pass out of the works, and tickets are punched for quitting time. This general routine is repeated in the afternoon when the whistle blows, and also again at the quitting hour in the evening. Molders and other foundry employees whose time of labor is determined by the "heat" secure the punching of their tickets as their respective tasks are accomplished. Instead of the hour of stopping being punched, the word "heat" on their tickets is punctured, as already mentioned. At the close of the day the tickets, which are now in the shape of vouchers for so much labor performed, are taken up by the timekeeper, and from them the pay-roll of the works is made out, and from them also entries of labor on the foundry report, to be described further on, are made. The tickets are finally filed away, and in the event of any misunderstanding are available for reference. Disputes about time, however, are of rare occurrence, for the workmen detect mistakes, if any are made, at the time they happen and at the moment when correction is most easily made.

The arrangement of numbers on the face of the tickets will be readily understood on a moment's inspection. In the center space, entitled "Number," there are three rows, from 1 to 0 each. By punching these, workmen can be designated from 1 to 999, a range sufficient for establishments of moderate size. In the "Time" column, at the right, there are printed two lines of full-faced figures, one reading from 1 to 6, inclusive, and the other from 7 to 12. Below each of these, in common type, are two sets of "quarter-hours," 15, 30 and 45 minutes. If a workman commences at 7.15, for example, the "7" at the top of the first column would be punched and the "15" in the first set of quarter-hours below in the same column. If he quit work at 11.30, for example, the "11" in the first column would be punched and also the "30" in the second set of quarter-hours in the same column. The first right-hand column then, it will be seen, records commencing and quitting time for the forenoon. The next column serves the same purpose for the afternoon. The number of hours for which a workman is entitled to pay is punched under the head of "Day Work," at the top of the ticket. The amount indicated at this place would, of course, be determined by the punchings in the two columns last described. Even hours, from 1 to 10, are printed in full-faced type in the first two columns, while the quarters, 15, 30 and 45 minutes are given in the third column. Overtime is provided for in the same general manner. The hours and fractional part of an hour worked is recorded in the column on the left of the ticket. In the same general manner the time engaged upon piece work is recorded at the bottom of the ticket. Keeping a record of the time devoted to piece work in such a manner as to contrast the amount paid with the hours consumed proves a convenient basis by which to correct and properly adjust piece prices.

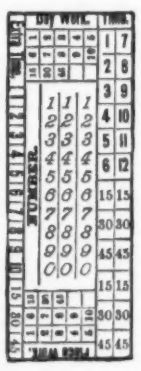
We show two tickets as they would be punched under the general system we have described. One of these is a foundry ticket, and reads as follows:

No. 5. Commenced (forenoon) 7 o'clock; quit 12 o'clock; commenced (afternoon) 1 o'clock; quit with "heat." One hour extra time was made, and of the 11 hours, 10 were on piece work and one on day work. The other reads as follows: No. 136. Commenced (forenoon) at 7.30 o'clock; stopped at 11.45; commenced (afternoon) at 1 o'clock and stopped at 5.30. Of extra time 2½ hours were made, which, it will be seen by the punching of the upper end of the ticket, is to be paid for as day work, while the 8¼ hours made in regular time are to be paid for as piece work.

What remains to be described of the system of recording cost in the Hopson & Chapin foundry is of a character to be used as well perhaps with some other system of taking time as with what we have given above, but, as it is employed in connection with the foregoing, it has seemed best to describe the two together. As the ticket plan is something of a novelty, and as it is applicable in various directions, we have presented it at more length perhaps than would otherwise have been deemed desirable. As employed in the establishment referred to, it is simply a useful auxiliary to the daily foundry report, the general form of which is shown herewith.

The foundry report as employed by this company measures 16 inches in width by some 21 inches in length. Its use will be understood by a very general description. In the first column there is inserted the names of the molders employed. The spaces for these names are equal to three lines across the report, thus giving each molder the opportunity of working on patterns belonging to three different orders. The second general space in the report is entitled "orders," and in it is entered the work that is in progress. The first subdivision, entitled "number," receives the record of the order by number, or the number of the particular design to which the pieces belong; the second, entitled "who for," is used where goods are made on order for certain individuals or firms, while the third column, entitled "pattern," designates by name the piece that is being used. "Quantity" receives the number of pieces involved in the order, and is inserted here to keep before the foreman of the foundry what is to be done. Orders when first received are entered upon the order book in the office, and are there analyzed, separating the various goods into their component parts. An abstract of this is transferred to the book of the foundry foreman, and in turn the items from it are entered opposite the names of molders on the foundry report sheet. With the names of the molders employed, and the work upon which they are engaged opposite them, all arranged as we have described, the filling out of the foundry report becomes a comparatively simple matter.

There is recorded on the foundry report by the foundry foreman, upon the day the work is done, the number of molds put up of each pattern by each molder, and also the number of pieces contained in the molds. The sheet then passes to the inspector, who inserts a record of the "lost" and "broken" pieces, columns for which are provided, and also the number of "good pieces." He also inserts the "weight" of the good work. This portion of the record is of necessity made on the day succeeding the day in which the molding was done. The report completed to this point passes from the inspector to the time-keeper, who, with a knowledge of the terms upon which the various workmen are engaged, enters the piece-work price, and also the day-work price, and makes extensions into the column entitled "amount earned." The last column of the sheet, headed "remarks," is filled out on special occasions by the foundry foreman with such particulars as the time occupied in making matches or doing any work which is not regularly included in the head of molding. With this analysis of a day's work in the office, it will be seen that it is easy to determine the cost of work produced, so far as labor is concerned, in almost any shape that may be desired. The total pounds of work produced in a day's run, divided into the total amount of wages paid, will give the cost per pound of labor, taking the general average of the work. On the other hand, the number of pounds produced of individual items, divided into the labor cost of the same, will give the cost per pound of these individual parts, independent of all other items. In like manner the number of individual pieces made, divided into the labor cost of producing them, will give their cost per piece.



Front.

Back.

Fac-Simile, Half Size, of Time Tickets Employed by the Hopson & Chapin Mfg. Co.

The labor cost in the foundry, however, is in some sense easier to be arived at than the cost of material and superintendence combined with rent, power and general expenses. In the system pursued in this establishment the business is required to earn a sum equal at least to the legal interest on the capital invested and such expenses as insurance, repairs, &c., before it is considered to be making a profit at all. It is necessary, therefore, in arriving at the actual cost of work, to take into consideration the interest on invested capital, called for convenience rent, the cost of power, superintendence, general expenses, &c. The plan of estimating the cost of work, so far as relates to items of this sort, is shown in the table on this page. This form has been copied from one of the daily reports made out in the establishment referred to, but for obvious reasons we have substituted asterisks for the figures on the sheet shown us. The record, it will be noticed, is kept by the different charges constituting a heat. Several qualities of iron are used in order to secure the mixture best adapted to the work made. Of the brands at present being employed there may be noted "Chattanooga," "Thomas" and "Alice." A record of "sprues" and "back stock," the latter comprising the shot from the tumbling barrels and the over iron from the cupola, is also kept. In making the charges the first is made with coal and coke combined, while the second and third use coke alone. In the first charge "Thomas," "Alice," sprues and over iron are combined, while in the second "Chattanooga," "Thomas," "Alice" and sprues are used. The third charge is the same as the one last named, with the addition of the shot. In keeping this record the extensions are made in such a manner as to give the total fuel consumed in each of the individual charges, and also the total amount of fuel used in the heat. In like manner the total of the iron is kept, so as to show the total pig iron used in each charge, the total scrap iron in each charge, and the grand total not only of the charges, but also of the heat. Extending across the table in the opposite direction, there are noted the cost of the coal consumed, the cost of the coke and the cost of the iron, including both pig and scrap. The total of these several items gives the total cost of material employed in producing the work which the foundry report for the same day shows has been made. This amount is then placed in the vertical column shown at the right, and to it are added items for superintendence, attendance, fixed charges, rent and power, pattern work and all other charges. Superintendence and attendance are items determined by the actual expenses paid from day to day, and are a matter of calculation, the same as the labor account, already referred to. Fixed charges include items that are arbitrary in character and which are proportioned so that their daily pro rata may be entered in this account. Rent represents the daily proportion of the interest on the money invested in the works, while power is the consumption of fuel for the day, &c. Pattern work includes the necessary tinkering of patterns to adapt them to the individual orders in hand. By the nature of the business conducted by this establishment, it is presumed that the patterns will be delivered complete, or will be made at the expense of the parties ordering the castings. Nevertheless, repairs, changes, &c., are occasionally demanded, and such items become a part of the daily cost of work produced. Hence the item last noted. All other expenses, including allowances for lubricating oil, sand, facings, &c., are included in the last item. By taking, therefore, the total of the materials, worked out as we have already described, with these items last mentioned, and the labor account previously explained, the total cost of work made is shown.

Returning to the column entitled "grand total," near the center of the table, by taking the total amount of iron melted, and subtracting from it the back stock, there is shown the net result of the heat in pounds. Dividing the pounds of iron melted into the total cost, including the labor computed on the foundry report, gives the cost per pound for making the work shown on the foundry report, or, leaving out the gross labor item from the foundry report, and dividing the cost of materials, superintendence, fixed charges, &c., by the same, gives the cost of material and superintendence per pound, which may be added to the cost of labor per pound of the individual items shown on the face of the foundry report. From this it is evident that by the plan pursued the managers have it in their power to make estimates of cost upon any basis that may be desired. Dividing the total pounds of fuel consumed into the pounds of iron melted gives the ratio of economy. This is regularly determined in the general plan indicated at the bottom of the table referred to. There is also recorded on this blank the time in minutes occupied in melting, and also the ounces of pressure as indicated by the pressure gauge. It is hard to imagine anything more instructive to the foundry manager than a book of records of this kind, showing in a manner facilitating comparison the cost from day to day for a month or a year, or, as in this case, affording the basis of comparing individual days of one year with corresponding days of another year.

FOUNDRY REPORT.

HOPSON & CHAPIN MFG. CO. NEW LONDON, CONN., ... 188 ...

Name of Molder.	No.	Orders.			Work.				Good.		Time.		Amt. Earned.		Remarks.
		Who For.	Pattern.	Quantity.	Molds	Pcs.	Lost.	Brkn.	Pcs.	Lbs.	Pc. Wk.	Day Wk.		Total.	

Form of Foundry Report Employed by the Hopson & Chapin Mfg. Co., New London, Conn.

Heat.	Coal, cost. *****	Coke, cost. *****	Total.	Chattanooga.	Thomas.	Alice.	Sprues.	Back stock: Shot.	Back stock: Over iron.	Total pig.	Total scrap.	Grand total, cost. *****	Time.	Pressure.	Total ***** Total.... *****
First charge...	***	***	***		***	***	****		***	****	****	****	** m.	** oz.	Superintendence..... *·**
Second charge.		***	***	***	***	***	***			****	***	****			Attendance..... *·**
Third charge..		***	***	***	***	***	***	***		****	***	****			Fixed charges..... *·**
										Total...		****			Rent and power..... *·**
										Less back stock...		****			Pattern-work..... *·**
										Net result in pounds...		****	÷		All other charges..... *·**
	Economy..		***	Pounds fuel to melt.....								****	Pounds iron.		Total cost..... **·** = .****

Cost of Castings Per Pound, as Figured on Daily Foundry Report.

At a meeting of the Importers' and Grocers' Exchange, in this city, resolutions were passed representing the importance of regular and rapid mail communication with China, Japan and the East Indies, and the necessity of action on the part of the Government since the refusal of the Pacific Mail Steamship Co. to carry mercantile correspondence. The time now to Yokohama is 58 days instead of 26 days, as formerly.

A steel snagboat, 187 feet in length, is building in Pittsburgh for the Government. Over 300 tons of steel will be used and 46,000 pounds of rivets, of which there are two rows in each sheet.

American Institute of Mining Engineers.

HALIFAX MEETING.

Third Notice.

Mr. Routledge's paper on the "Cape Breton Coal Fields" was read by the secretary, accompanied by explanations, with maps and geological charts. The paper was a very complete and detailed description of the fields, giving full statistics as to the workings, capacity and extent of the mines.

The secretary also read a paper by Mr. Fred. W. Gordon on the "Work of the North Chicago Blast Furnace, which we shall publish in a future issue.

Concluding Session.

The evening session was held in the Young Men's Christian Association Hall, and proved in many respects one of the most interesting of all.

The first paper read was that by Mr. Chas. A. Ashburner, geologist in charge of the Pennsylvania Survey, on the interesting topic of

THE GEOLOGY OF NATURAL GAS IN PENNSYLVANIA AND NEW YORK.

The existence of natural-gas springs in Pennsylvania and the adjoining States west of the crest of the Alleghany Mountains was known to the earliest settlers. Possibly the first gas obtained from a well was at Fredonia, Chautauqua County, N. Y., where a well was sunk on the bank of Canadaway Creek, near the Main street bridge, in 1821, and sufficient gas obtained for 30 burners, the inn having been illuminated by the gas when General Lafayette passed through the village, about 1824. In 1858 another well was drilled which supplied 200 burners, and a still larger one was drilled to a depth of 1200 feet in 1871. According to Mr. E. J. Crissey, secretary of the Fredonia Natural Gas Light Co., the average monthly supply of these wells in 1880 was 110,000 cubic feet.

Since 1859, when the drilling of oil wells in Western Pennsylvania was commenced, natural gas has been obtained either in conjunction with oil or in wells which produced only a trace of oil. In most of the flowing oil wells the pressure which forces the oil up the well results from the gas contained in the oil-sand in the immediate vicinity of the well or at a considerable distance away. The gas obtained from these wells has been utilized in various ways, particularly for light and fuel at the towns and villages in the immediate vicinity of the wells, and also to a limited extent for the manufacture of lampblack —sometimes called "diamond black"—by the deposition of the carbon resulting from the imperfect combustion of the gas. A comparatively small proportion of all the gas produced in the region, however, was made use of until within two years, when the introduction of gas into the industrial establishments—principally iron, steel and glass works—in the vicinity of Pittsburgh have made its use as a fuel an important consideration in the manufacturing industries of Western Pennsylvania.

The geology of the oil regions of Pennsylvania has been carefully studied during the past 10 years by the geologists of the Pennsylvania Survey, but more particularly by Mr. John F. Carll, who since the commencement of the survey in 1874 has been in charge of the special examination of that district. The detail geology of the region has been made public through numerous State reports, which relate principally to the consideration of geological problems affecting the occurrence of petroleum; they necessarily, however, refer indirectly to the geology of natural gas, although no great attention has been directed to the latter question until the past summer, when a special survey was commenced by Mr. Carll for the State of the geology of portions of Western Pennsylvania in the vicinity of the recently-discovered oil and gas pools, more particularly the latter. Until this survey is finished and Mr. Carll's report is published our knowledge of this interesting question must be more or less incomplete.

The extensive drilling which is now being done by manufacturers, gas companies and property owners in all sections of Western Pennsylvania and contiguous areas in adjoining States, where it is thought natural gas may be obtained, has made the study of the geology of natural gas one of pressing importance as an aid to locate profitable wells.

Much is being published as the result of interviews with practical gas explorers and professional geologists on the subject, and, while I do not wish to anticipate the results of Mr. Carll's investigations, I desire to record a few general conclusions which have resulted from field observations extending over a period of 10 years, and from numerous studies made in conjunction with Mr. Carll of the results of his oil surveys, which have been more thorough, more complete and valuable than any which have been made relating to the geology of petroleum.

The general conditions upon which the occurrence of natural gas seems to depend, from a consideration of the facts at present at our command, are: (*a*) the porosity and homogeneousness of the sandstone which serves as a reservoir to hold the gas; (*b*) the extent to which the strata above or below the gas-sand are cracked; (*c*) the dip of the gas sand and the position of the anticlines and synclines; (*d*) the relative proportion of water, oil and gas contained in the gas-sand, and (*e*) the pressure under which the gas exists before being tapped by wells. Other conditions may still be discovered which will have as important a bearing upon the problem as these which I have stated. The oil and gas regions of Pennsylvania are one in a geological sense. The strata drilled through by the gas wells in the vicinity of Pittsburgh (now considered the most important gas district) are in a general way the same as the strata in the different parts of the Devonian and carboniferous series pierced by the oil wells at Smith's Ferry (30 miles north 60° west from Pittsburgh) and the Slippery Rock (34 miles north 20° west from Pittsburgh) districts, where in both cases heavy oil is obtained from the base of the coal measures and amber oil from the Berea Grit; in the Thorn Creek (25 miles north 5° east from Pittsburgh) and south end of the Clarion Butler and Armstrong (28 miles north from Pittsburgh) districts, where oil is obtained from the Venango (Devonian) sands; and in the Pleasant Unity (30 miles south 65° east from Pittsburgh), Dulap Creek (31 miles south 12° east from Pittsburgh), Whiteley Creek (45 miles south from Pittsburgh) and Dunkard Creek (48 miles south from Pittsburgh) districts, where oil is obtained from the Mahoning sandstone (lower barren coal measures) and overlying strata. The discovery of oil at Mt. Nebo, about 8 miles northwest of Pittsburgh, and the several small oil wells reported to have been obtained in close proxmity to the Washington (Chartiers Creek) gas wells, together with traces of oil found upon special examination in the gas from wells which are supposed to produce absolutely dry gas,* the existence of natural gas either in or near all the productive oil pools under geological and physical conditions similar to those found to obtain in what are frequently spoken of as "natural gas regions proper," are all sufficient reasons for considering the districts producing either oil or gas exclusively (?) one geologically. This conclusion is an important one in the consideration of this question, and it is believed that it is fully borne out by the numerous columnar sections of strata in Western Pennsylvania which have been published by the Geological Survey.

The general structural geology of the oil and gas regions is comparatively simple. The rocks lie nearly horizontal, being thrown into broad and almost imperceptible rolls by southwest dipping anticlines and synclines which are parallel in a general way to the escarpment of the Allegheny Mountains, and which produce gentle northwest and southeast dips from the crests of the anticlines down toward the center of the synclines. An appreciation of the intensity of these dips may be had from the following figures: From the city of Bradford, in McKeon County, immediately south of the Pennsylvania and New York State line, and about 72 miles in an air line, a little south of east of the city of Erie, the strata dip at an average rate of 14 feet per mile to Oil City, which is 64 miles south 55° west of Bradford From Oil City to Pittsburgh, a distance of 70 miles in a direction south, 12° west, the average rate of dip per mile is about 20 feet From the city of Erie to Beaver, on the Ohio River, at the mouth of the Shenango River, the distance is about 100 miles in a direction south, 7° west, and the average rate of the fall of the strata is 20 feet per mile. Although these are the general dips of the rocks, yet many local dips occur very much greater in the areas between the localities named. The maximum dip in the Bradford oil regions which I determined from my surveys in 1879 was 69 feet per mile, and this for a distance of only 2½ miles. In the Venango oil belt and southern end of the Butler oil belt the dip of the oil sands, as shown by Mr. Carll's survey, rarely exceeds 35 feet per mile. A dip in the strata at the rate of 75 to 100 feet per mile, for even very short distances, is the rarest occurrence.

Although the horizontal structure of the oil and gas regions is comparatively simple, the columnar structure, as revealed both by the study of the outcropping rocks and the records and drillings of oil wells, is not so easily understood, and in special areas is more or less complex. The rocks which have so far been found to produce natural gas are found in a vertical range of about 3000 feet of carboniferous and Devonian strata, extending from the Mahoning sandstone at the base of the lower barren coal measures, which is on an average about 500 feet below the Pittsburgh coal bed, down to the Smethport oil-sand in McKean County, which is 360 feet below the great Bradford oil-sand of that region. The principal gas horizons are (*a*), the probable representative of the Venango first oil-sand at Pittsburgh, which is from 1800 to 1850 feet below the Pittsburgh coal bed, and contained, as I believe, in the Catskill formation No. IX; (*b*), the Sheffield gas-sand, which appears to be the lowest oil and gas sand in Warren County; the horizon of this sand is about 800 feet above the bottom of the interval of 3000 feet; and, (*c*), the Bradford oil-sand, which occurs 1775 feet below the base of the Pottsville conglomerate, which is the lowest member of the lower productive coal measures. The Sheffield and Bradford sands are undoubtedly of Chemung age. While most of the largest gas wells which have been drilled in Pennsylvania have obtained gas from these three horizons, yet gas in commercial quantities is not exclusively confined to them. Between the Mahoning sandstone as the top limit and the Smethport oil-sand as the bottom limit about 10 (more or less) prominent sand beds have been found which produce petroleum, and each one of these sand beds has been found to contain gas in greater or less quantity, nor is it possible to say that the gas is confined exclusively to these definite sand horizons, for sand beds having only a local occurrence, but included within the rock interval of 3000 feet, may contain gas.

The origin of natural gas has an important bearing upon its economic geology. Although it is believed that we are in possession of much data to throw some light upon this interesting question of cause, yet it is still shrouded in too much uncertainty to permit of complete explanation. It is necessary, however, that some statement should be made in regard to the origin of gas in order to thoroughly comprehend the conditions upon which its existence seems to depend. It would appear that the gas is closely related to petroleum, and that their origin is due largely to the same cause—the decomposition of animal and vegetable life. It is not believed that the gas is indigenous to the sandrock from which it is obtained, but comes from the decomposition of life forms which were entrapped in underlying strata. If this be so, the amount of gas contained in any one sand depends, first, upon the extent to which the rocks are cracked between the horizons of such organic remains and the sand reservoir in order to permit the gas to flow into the sand; and, second, upon the extent to which the rocks are cracked above the gas-sand, which would permit the gas to escape into the atmosphere and totally disappear.

That the absence of both petroleum and natural gas in our plicated strata east of the oil regions is to be explained by the cracking of the rocks would seem to be evident, since the survey of the outcropping rocks and a study of the records of dry wells show that the oil and gas sands extend far beyond the limits of the area of the region in which any traces of oil or gas have ever been found. Even within the area where oil and gas wells have been found the cracking or jointing of the rocks must have a potent influence upon the amount of oil or gas obtained in certain localities. From the surveys of Mr. Awsheafer and myself in Elk County it appears that the direction of certain streams is to be attributed to their flow along joints in the rocks which have resulted from the contraction of the rocks during the process of secular cooling, and I believe that this in a measure accounts for the occurrence of gas at certain points in western Elk County and its absence at other points, the gas being obtained where the rocks are not jointed, and not being found where they are jointed.

The first necessary condition for the presence of gas, however, is dependent upon the existence of a porous rock to serve as a reservoir to hold it. A number of wells have been drilled which have found gas, but, if the drillers records are to be credited, have not pierced sand beds; in these cases the gas has been unquestionably obtained from a crack in the strata which serves as a conduit to convey the gas from its sand-bed reservoir to the well. Although the dip of the gas-sand and position of the anticlines and synclines have an important bearing upon the occurrence of gas (in many cases this would seem to be the most important consideration), yet it is not believed that natural-gas wells can be located on what has been formulated as the anticlinal theory, since all great gas wells are not found along anticlinal axes, although some of the largest and most important wells in Pennsylvania have been found in such positions, and a great many wells have been drilled in synclines which have found gas. These two statements are of great importance, since a large amount of money is now being expended in drilling wells which have been located on the basis of the anticlinal theory, so called. The following references to notable instances where gas has not been found on anticlines, and where it has been found in synclines, will serve as sufficient illustration:

Most of the saddles and basins in Western Pennsylvania have a progressive dip along their axial line toward the southwest, and a well drilled ½ mile to the northwest or southeast of a given point on the crest of an anticline may encounter any given stratum at the same elevation as a well drilled immediately on the crest of the same anticline at a distance southwest from the given point, the distances in each case being dependent upon the intensity of the dip in the three directions. The anticiinal along which the famous Murraysville gas wells in Westmoreland County have been drilled is an instance. About 10 miles northeast of the village of Murraysville two large gas wells have been obtained about 3 miles apart, northwest and southeast, one on Beaver Run the other on Pine Run. The total dip of the Upper Freeport coal bed from the Beaver Run well to the Pine Run well is 215 feet, or at the rate of 70 feet per mile toward the northwest. The former well is found in close proximity to the anticlinal axis along which the great Murraysville wells are obtained further to the southwest, while the latter well is near the synclinal axis. The extension of the general direction of this anticlinal line to the northeast of the Beaver Run well crosses the Conemaugh River near the mouth of Roaring Run, where a well was drilled, evidently on account of the existence of the anticline at that point, but no gas was found. The Appollo well, about 3 miles northeast of the Pine Run well, along a line parallel to the structural lines of the district, found no gas. In the case of the Roaring Run and Apollo wells, it may be possible that no porous stratum which could serve as a gas reservoir was pierced by the drill; this, as already stated, is the first necessary condition of the existence of gas.

The Ridgway gas well is located in a syncline, and not on a subordinate anticline, as has been suggested, but at a point where there is a certain regular dip of about 1° toward the west, on the side of the syncline. The Kane gas wells, including the large one at Kane, which is now supplying the residents of the town with light and fuel, and the famous Kane Geyser gas well, are both in a syncline, the southeast dip in the one case and the northwest dip in the other case, toward the center of the basin, being less than 50 feet per mile, and the southwest dip along the axis of the basin being from 15 to 25 feet per mile. The great McMullen & Hallett gas well, commonly known as the "Mullen Snorter," is not in the vicinity of any anticline. The gas-sand at this well is nearly horizontal, having only a dip of about 11 feet in a direction south, 15° west.

The gas wells found in the vicinity of the city of Erie are located in a region where no anticlines or synclines have been discovered. The dip of the rocks here is toward the southwest at the rate of about 20 feet per mile, from recent surveys, or, from the surveys made nearly 50 years ago by the first geological survey as pointed out by Professor Lesley, the average dip was estimated to be 14 feet per mile. No anticlines exist in the vicinity of the Fredonia (N. Y.) wells, so far as the structure has been made out. Conversely, some of the largest gas wells have been found on the crests of anticlinal axes; among them can be enumerated the Sheffield well, about 2½ miles east of Sheffield, which was drilled in 1875. This well still supplies the town of Sheffield with light and fuel and has proved one of the largest and most remarkable gas wells ever drilled in Pennsylvania. The history of this well is interesting on account of the great pressure of the gas, which made the drilling difficult. In drilling this well a vein of salt water was passed through at a depth of 418 feet, and the gas-sand, which was 30 feet thick, was struck at a depth of 1350 feet. The water from this vein leaked into the hole and rapidly froze from the great pressure under which the gas was confined in the bed rock, and which was suddenly relieved as soon as it flowed into the well (the sudden change of the pressure of the gas absorbing the heat from the water, which rapidly froze), until the well became almost entirely stopped up by the core of ice for a distance of nearly 200 feet above the gas-sand. The Wilcox wells, 5 miles northeast of the village of Wilcox, in Elk County, are all of them located within ¼ mile of the crest of the anticlinal which separates the fifth from the sixth coal basin, the dips on either side of the axis of this anticlinal, toward the northeast and southwest, being at the rate of about 50 feet per mile. The dip of the rocks at the Sheffield gas well is not quite so great as at the Wilcox wells. The gas wells in the vicinity of Marionville, Forest County; at Tarentum, in Allegheny County; at Murraysville, in Westmoreland County; at Cannonsburg and Hickory, in Washington County, are all located in close proximity to anticlinal axes.

An interesting fact connected with the influence of the dip of the rocks as independent of the position of the anticlinals as influencing the presence of gas is to be seen in the flooding by water of the gas sand in the vicinity of Pittsburgh, as recently pointed out by Mr. Carll. A line showing the limit of the flooded rock at this point has been approximately located by Mr. Carll, and in the area included by it but little gas has been found, although the gas-sand has been pierced by the drill. The rapid diminution in the flow of the gas from the wells in the vicinity of East Liberty would seem to be due to the driving back of the gas by the flooding of the gas-sand with water.

The relative proportion of water, oil and gas in a sand bed and the pressure* under which the gas exists have an important bearing upon the occurrence of gas when considered in conjunction with the dip of the sand and the position of anticlines. If nothing but gas existed in a given sand bed form which the gas could not escape by cracks into overlying strata, and the quantity of confined gas was so great that it should fill all portions of the rock with gas under a great pressure, it must be apparent that, no matter where the gas-sand was pierced by the well, the same quantity of gas would be obtained, excepting so far as it might be influenced by the force of gravity. If petroleum, water and gas should all exist in the same sand bed, the pressure on each would necessarily be approximately † the same if there was an open connection throughout the whole extent of the rock in which they occurred, but the water would seek the lowest level of the sand bed, the oil the next and the gas would be found in the highest portions. This same condition of affairs would exist where either water or oil existed in the sand with the gas to the exclusion of the other. A careful study of these facts makes it apparent that under special conditions the anticlinal theory alone will account for the existence of gas; but when, however, it is known that large gas wells have been found in synclinals, it is quite certain that the occurrence of natural gas in the Pennsylvania and New York regions cannot be explained but by a careful consideration of all the geological and physical conditions under which it is obtained.

The facts relating to the geology of natural gas now in the possession of any one geologist are not sufficiently numerous or connected to permit of the acceptance of any ultimate theory; and it is only possible for the present to deduce special geotectonic conditions under which natural gas has so far been exploited. Some of these conditions are so varying and apparently antagonistic that it is only possible to differentiate any general law controlling the occurrence of natural gas by a comparison of the individual facts obtained from innumerable well drillings.

Mr. C. D. Angel, one of the most successful oil operators in the early history of petroleum mining, deduced a theory in 1867 accounting for the existence of oil in definite areas. This was known as the "belt theory," and it sought to maintain that oil would always be found along lines having a definite direction, and to this day many oil wells are located upon degree lines upon the basis of the belt theory. It has long been proved by the investigation of geologists and the results of practical drillers that within individual oil pools the most productive wells have been located along definite degree lines, yet the belt theory has long since been abandoned by the most intelligent operators as being insufficient to account for the existence of petroleum under all conditions. The history of this theory will doubtless prove analogous to the history of the anticlinal theory as accounting for the existence of gas. Many gas wells are now being located in Pennsylvania and West Virginia and Ohio on the basis of this theory, and in many cases the practical driller is rewarded by finding the object of his search, but it is quite certain that the theory as an ultimate means for the locating of gas wells is quite insufficient, and will lead to ultimate failure in special cases.

An interesting discussion ensued on the matter, in which several points were brought up. Dr. Raymond mentioned, as an illustrious instance of mineral oil which had had a very brilliant existence while it lasted, the Albertite, of New Brunswick, now all exhausted. He inquired as to the extent of the oil deposits of Canada, and asked if there was an increase of territory corresponding to the successive exhaustion of wells, Dr. Hunt was unable to furnish a detailed reply, but believed fresh oil discoveries might yet be made in Canada. The paper was supplemented by extended remarks by Dr. Sterry Hunt, who referred to various oil wells and natural gases in different locations in Canada and the United States. He cited an instance in Ontario where a good flow of oil from a rock crevice had ceased on the earth's surface upon the drilling of a gas well, the elasticity of which, when confined, had been the cause of the oil spring.

Mr. Ashburner said that, although he had not investigated the Canada field personally, he had had about 18 months ago extensive correspondence with gentlemen interested in oil development in Ontario, from which he believed the reason of the comparatively small extent of Canada's oil resources as yet was the cheapness of the Pennsylvania article and the little encouragement there was for investment of capitol. He imagined that extensive resources might yet be developed when the demand grew, and had also been informed by an experienced prospector that there were great hopes of finding oil in New Brunswick.

"A New Method for the Determination of Phosphorus" was the title of the final paper, read by its author, Mr. J. B. Mackintosh, chemist, of New York, which detailed the results of various experiments recently made by him with successful results, using oxygen in place of hydrogen gas.

As the last paper of the session the president read what was to have been the opening address, but which, as has already been stated, was deferred. It was printed in our issue of September 24.

At the close Mr. Wm. Kent moved the thanks of the Institute for the address, and his example in speaking on the subject was followed by a number of the members present.

Mr. J. D. Weeks moved that the thanks of the Institute be most cordially tendered to the people of Halifax, the committees, the citizens generally, the ladies and to all who had in any shape or form contributed to the greatly-appreciated reception and experiences of the members while there. He moved that the secretary be instructed to convey expression of said thanks, and also to the "committee of one" who had so ably, efficiently and satisfactorily looked after the weather. The motion was seconded by Mr. Collingwood, of New York, and others, and unanimously passed. The secretary said he would convey the expressions of the resolution to the "committee of one" in prayer, to the committee of citizens by letter, and to the ladies personally and individually.

The meeting then adjourned, it being 9 p. m., to the reception in the Province Building. This was an elegant entertainment. The best social element of Halifax, including the officers of the British military and naval forces, attended and showed the members of the Institute and their ladies much attention. The reception was held in the Chamber of the Legislative Council, and a fine supper was served in the chamber of the Legislative Assembly.

Next morning the members took early trains for the excursions they had selected—some to Cape Breton, some to Grand Pre, and some to Londonderry and Spring Hill. The result of a subsequent comparison of notes was that no one could be convinced that he did not choose more wisely than those who had chosen differently. Consequently, everybody had a great deal better time than anybody else, and all went home happy, with delightful memories of Nova Scotia and New Brunswick hospitality.

The Ansonia Brass and Copper Co., of Ansonia, Conn., have procured a patent for refining and preparing copper for casting. Eight pounds of zinc in the form of an oxide or carbonate are mixed with 1 bushel of ground charcoal, and are moistened, so as to make a stiff paste. This paste is portioned into, say, 24 parts, and is formed into rough balls and dried. The copper is placed into the crucible, and, when on the point of melting, one of the balls is dropped upon the copper, and gradually falls in pieces and covers the copper as it melts down, thereby excluding the atmosphere from the surface of the copper. At the same time the zinc in the mass is evolved and dispels any oxygen which may remain in the crucible. It may be supposed that the oxide of zinc will impregnate the copper, but such is said not to be the case. The charcoal coming in contact with the copper, and the oxide of zinc being volatile under the action of the heat, no combination with the copper takes place, and the zinc is volatilized and carried off through the flue, while the charcoal remains on the surface of the copper and combines with any excess of oxygen and burns, and at the same time the carbon combines with the copper sufficiently to cause it to remain solid when cast. Copper treated in this way is said to become perfectly malleable and to be thoroughly toughened.

A cupola furnace, the tuyeres of which diffuse the blast instead of concentrating it, has been patented by J. H. Whiting, of Detroit, Mich. The tuyeres occupy the usual position, but they enlarge from their inlet opening toward their discharge opening. Thus, their side walls become more or less tangential to the inner circle of the cupola. In vertical section the tuyeres are also of flaring shape, but not quite so much as in horizontal section. The inner ends of the tuyeres are shaped circularly, so as to be flush with the inner face of the cupola wall. The inventor states that, where it is an object to get iron of great fluidity that is rich in carbon, the diffusing tuyeres accomplish a better result than the tuyeres in ordinary use, which, on account of their form, are liable to concentrate the blast too much in the center of the cupola and to burn the iron—that is, to deprive it of some of its carbon.

A chimney has been recently completed for a lead-smelting works at Pueblo, Cal., which is 319 feet in hight and 10 feet in diameter in the clear from the foundation up. It rests on 16 feet of smelter slag, which was poured in a liquid state in the ground 16 feet deep, and allowed to cool and solidify. On top of this and above ground is a second foundation 16 feet high, made of brick. The stack proper, which is 287 feet high, is made of iron and lined with fire-brick. It is the largest stack west of the Missouri River.

---

* The gas obtainted from the Carpenter Well on the Daum Farm, Westmoreland County, was supposed to be free from oil or water; when, however, the gas was confined under a pressure of 180 pounds to the square inch, water was precipitated.

* The pressure under which the gas flows from different wells varies greatly. In the Pittsburgh district it ranges on an average between 100 and 200 pounds per square inch. Mr. Carnegie reports that at their works, where the gas is used 9 miles from the well, the pressure was 75 pounds per square inch. When I visited the Bessemer Steel Co.'s works, at Homestead, the recorded pressure was 60 pounds per square inch. The highest pressure I know of being measured was 750 pounds per square inch. I believe, however, I have seen the gas coming from wells under special conditions at even a greater pressure than this.

† The pressure at the bottom of a column of water or oil which nowhere could be of any very considerable hight would be slightly augmented by gravity.

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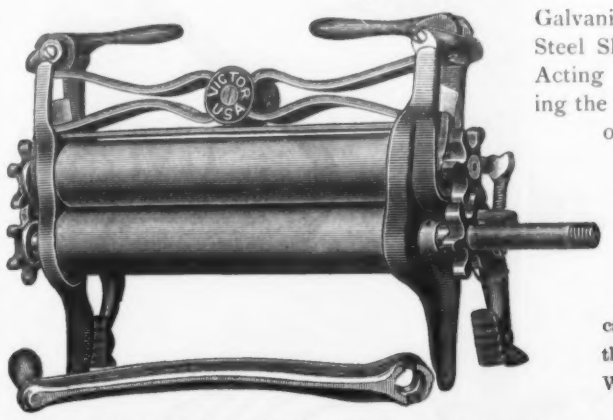

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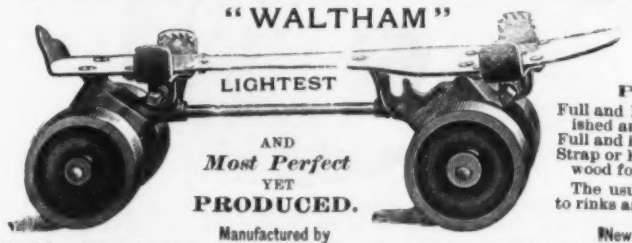

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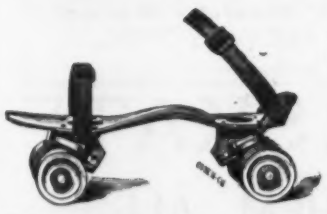

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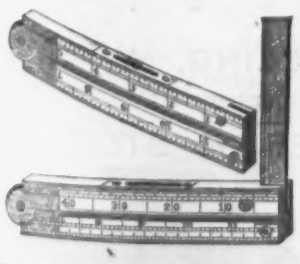

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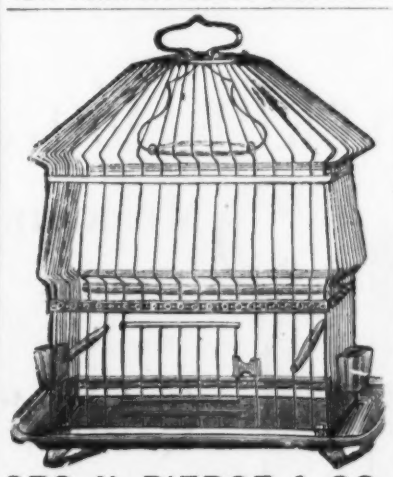

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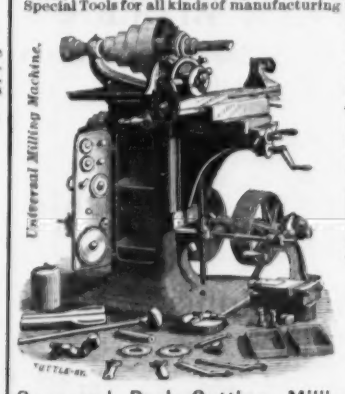

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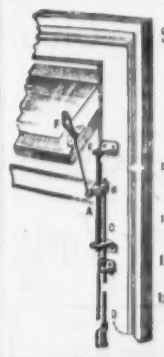

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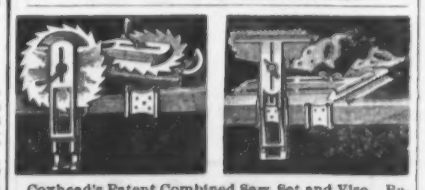

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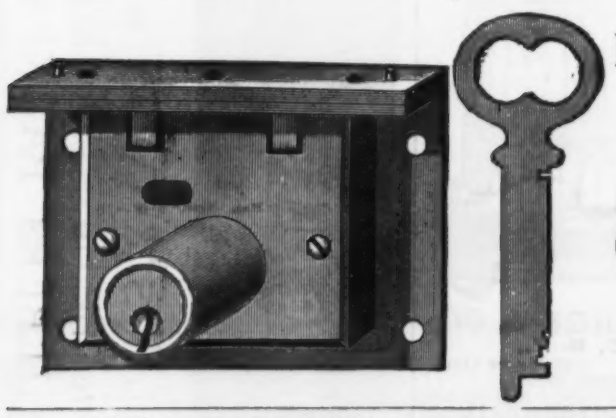

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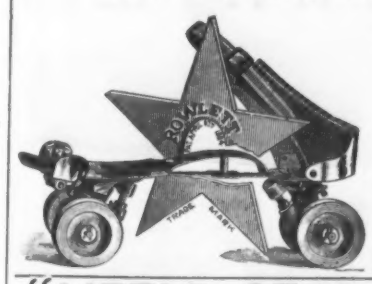

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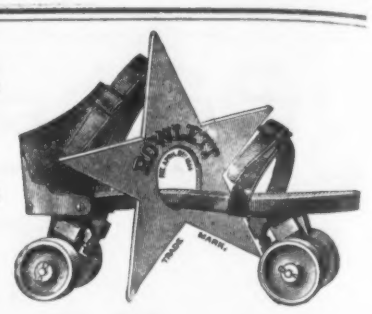

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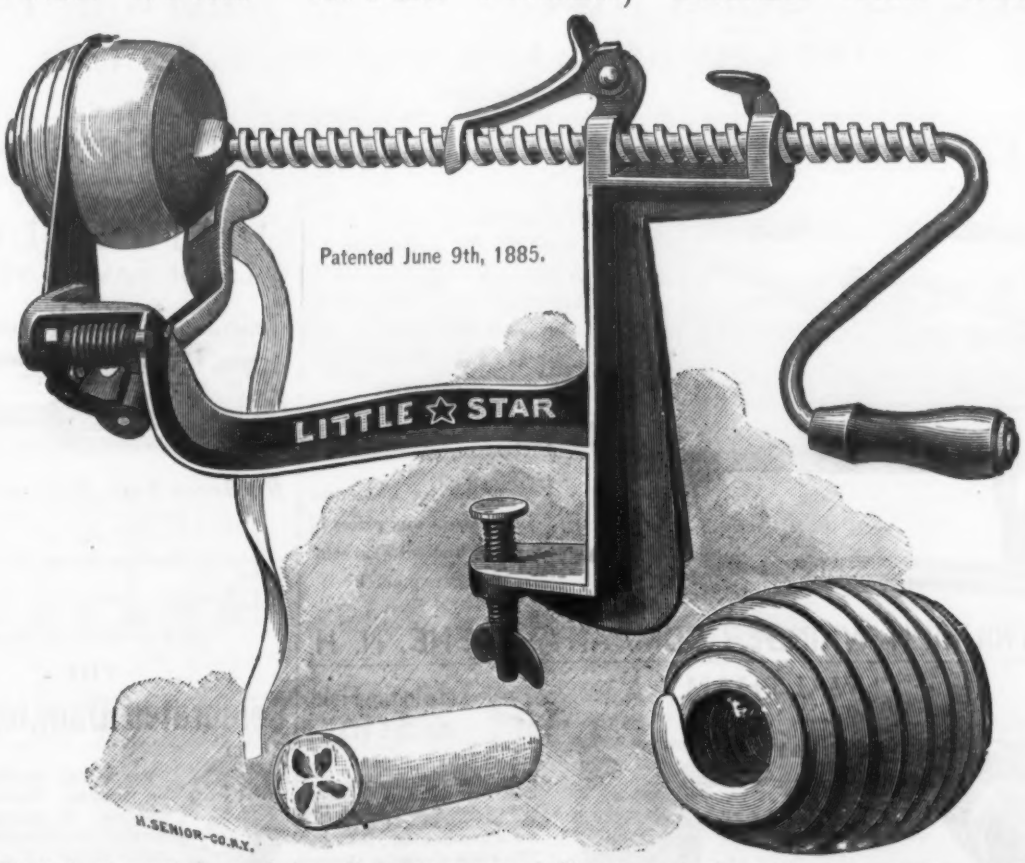

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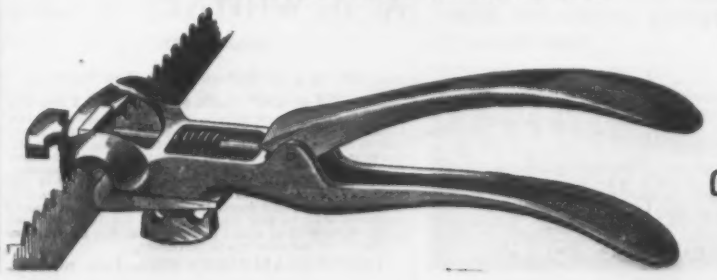

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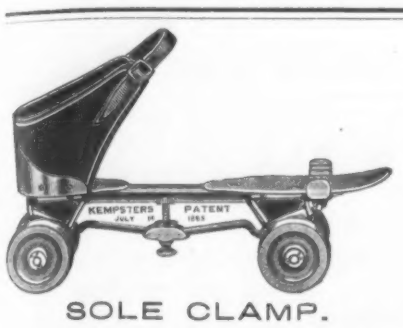

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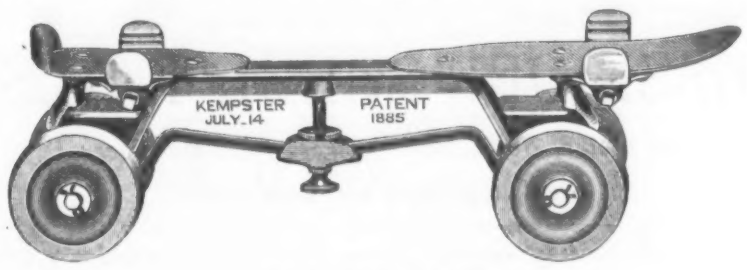

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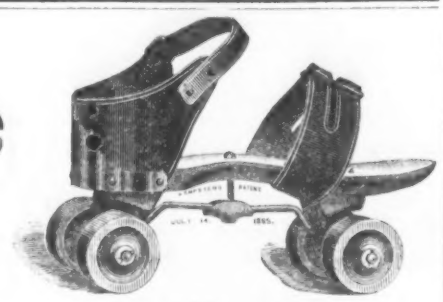

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Has great advantages over all others. It has more capacity, is easier handled by man and team, and the only Wheel Scraper made that does not make the horses' necks sore. It has all the latest improvements and excels any thing of the kind ever offered to the trade. Good on long and short hauls. Three sizes, 9, 13 and 16 cubic feet.

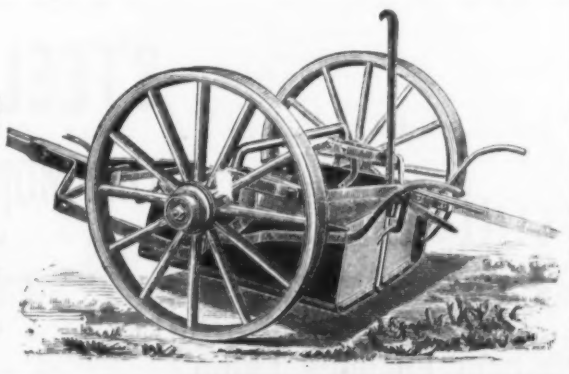
HASLUP'S ALL STEEL

DRAG SCRAPER

Beats all others for capacity, durability, strength and light draft. Being ALL STEEL (except wood handles), are lighter, stronger and better made than any other. Three sizes. Also Township and Railroad Plows.

SIDNEY STEEL SCRAPER CO.,

SIDNEY, OHIO, U. S. A.



The above cut represents one design of our new Hollow Handle Knife, either silver or nickel silver handles, made of a seamless drawn tube. This handle is not soldered, as is the usual method, and yet has the taper and form necessary to produce the most durable and tasteful article of its kind ever shown. Knives can be furnished either plain or ornamented handles.

R. WALLACE & SONS MANUFACTURING COMPANY,

MANUFACTURERS OF SOLID SILVER WARE GUARANTEED $\frac{925}{1000}$ FINE, ALSO NICKEL SILVER HOTEL AND TABLE WARE,

Factories, WALLINGFORD, CONN. New York House, 21 PARK PLACE.

New American File Company,

PAWTUCKET, R. I., U. S. A.

NOTICE.—Save 300 to 400 per cent. in Money and Time.

The testimonials in *Iron Age*, page 18, September 18 and 25, will convince most any one that our guarantee of this File doing the work of any two of any other brand, or money refunded, "is perfectly safe." Now, competitors who think they have made the same File for years can find out their mistake with a very little trouble, and save themselves money in advertising this File and mortification from being called stupid or otherwise. This class of File cannot be made so serviceable by any other method but one, and that one is covered by Caveat, filed by Patentee of above File.

RIPLEY MANUFACTURING CO.,

Unionville, Conn., U. S. A.

BEST PORCELAIN-LINED LEMON SQUEEZERS

"COMMON SENSE" MOUSE TRAPS, MALLETS BOOT JACKS,

ROSEWOOD FAUCETS, &c. Fine Wood Turning a Specialty.

THE PHILADELPHIA DROP FORGE,

Manufacturers of Every Description of

IRON AND STEEL DROP FORGINGS,

Machine Blacksmithing, Die Sinking and Machine Jobbing,

Rear of Nos. 1227 and 1229 Callowhill St., Phila., Pa.

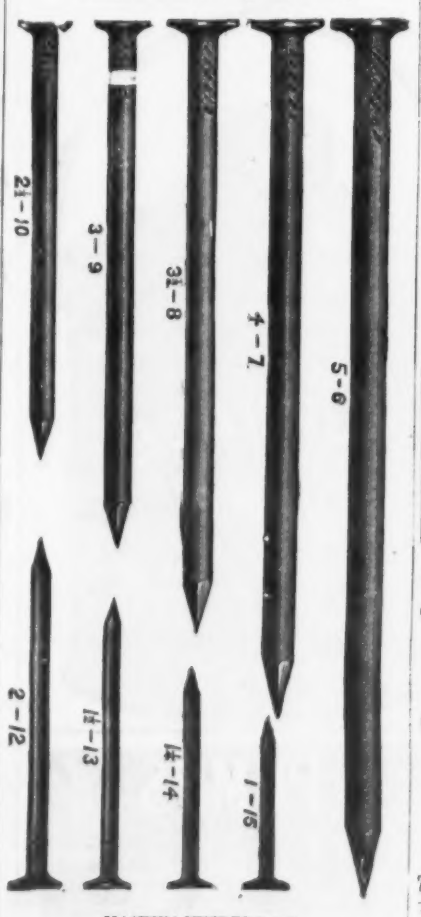
Samson Jack & Press Co., Black River, N. Y. Manufacturers of MALLEABLE IRON WAGON JACKS.

Made entirely of the very best Malleable Iron. They will not break, and, properly handled, will not get out of Repair.

Also Manufacturers of Hand Power Presses Of Every Description. *Send for Catalogue and Price*

THE HP NAIL CO.

CLEVELAND, OHIO,



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WIRE NAILS

OF ALL KINDS.

Barbed or Plain Steel, Iron and Brass Nails, Cast Steel Wire Brads, Cast Steel Wire Finishing Nails, Cigar Box Nails, Escutcheon Pins, Wagon Nails, Clinch Nails, Hinge Nails, Wire Spikes for Track, Bridge and Dock Work, Tinned Nails, Galvanized Nails.

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ANALYTICAL CHEMIST AND MINING ENGINEER,

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JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.

JEWETT & SONS' PERFECTLY PURE WHITE LEAD.

TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

181 Front Street, NEW YORK.

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The Atlantic White Lead and Linseed Oil Co.,

Manufacturers of

White Lead (Atlantic), Red Lead, Litharge, Glass Makers' Litharge and Orange Mineral;

LINSEED OIL,

Raw, Refined and Boiled.

ROBERT COLGATE & CO.,

287 Pearl St., NEW YORK.

EXCELSIOR AND CLIPPER LAWN MOWERS

GUARANTEED THE BEST & CHEAPEST IN THE MARKET.

HAND MOWERS 10 TO 20 IN.

HORSE MOWERS 25 TO 40 IN.

CHADBORN & COLDWELL MANUF'G CO.

NEWBURGH, N. Y.

Send for Circular & Price-List.

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GUILFORD, CONN.,

Manufacturers of

SCALES, BUILDERS' HARDWARE, LIGHT HARDWARE

And all kinds of

Light Grey Iron and Brass Castings of Superior Quality and Finish.

CORRESPONDENCE SOLICITED.

Grindstones, Emery, &c.

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Manufacturers of

GRINDSTONES,

MOUNTED STONES,

SCYTHE STONES, &c.

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Walter R. Wood,

GRINDSTONES,

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283 and 285 Front St., New York.

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GREEN PAPER BRAND TRADE MARK WASHITA STONE

Genuine Green Paper Brand Washita Stone is the Best

OIL STONE.

107th St., Harlem River, N. Y.

Miller, Metcalf & Parkin,

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CRESCENT STEEL,

IN BARS, SHEETS, COLD-ROLLED STRIPS, &c.

Polished, Compressed Drill Rods and Wire.

Warranted equal to any imported in *quality, finish* and *accuracy.*

Also Common Grades.

S. & C. WARDLOW SHEFFIELD, ENGLAND,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear Steel

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Razors, Table Knives, Mining Tools, Dies, Files, Clock, Watch and other Springs, and Sole Makers of the Special Brand "Tough" Cast Steel for Turning and other Tools.

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JESSOP'S BEST TOOL STEEL

IN GREAT VARIETY OF SIZES.

Gold Medals awarded at Exhibitions of Paris, 1878, and Melbourne, 1881.

ROCK DRILL STEEL, in bond or duty paid.
Sheet Steel, Best Circular Saw Plates, Double Shear Steel, Die Steel, &c.
MANUFACTORY, Sheffield, England.

JESSOP'S STEEL

As a SPECIALTY, we offer our **Best Tool and Die Steel,** ANNEALED SOFT, Also **Annealed Die Blocks,** from Stock or on importation orders at short notice.

Branch Warehouses Throughout the United States and Canada.

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THE SCRANTON STEEL COMPANY,

MANUFACTURERS OF

Steel Rails and Billets.

Works at SCRANTON, PA. NEW YORK OFFICE 47 BROADWAY.

The Indestructible Cast-Iron Furnace Lamp.

NO SOLDER.

The Best and Cheapest.

Superseding all Others wherever Introduced.

TWO SIZES: { No. 1, holding 3 Pints. / No. 2, " 2 "

TAYLOR & BOGGIS FOUNDRY CO.,
CLEVELAND, OHIO.

Sample sent you if desired.

STEAM PUMPS

SEND FOR PRICES.

VALLEY MACHINE CO. EASTHAMPTON, MASS.

G. W. Bradley's Edge Tools.

Butchers' Cleavers, Butchers' Choppers, Axes and Hatchets, Grub Hoes and Mattocks, Mill Picks, Box Chisels and Scrapers, Ring Bush Hooks, Ax Eye Bush Hooks, Socket Bush Hooks, Watt's Ship Carpenters' Tools, Carpenters' Drawing Knives, Coopers' and Turpentine Tools.

FOR SALE BY

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STEEL Gautier Steel.

SEE PAGE 3.

LABELLE STEEL WORKS.

SMITH BROS., & CO.,

MANUFACTURERS OF ALL KINDS OF

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ALSO SPRINGS, AXLES, RAKE TEETH, &c.

Office and Works, Ridge, Lighthill & Belmont Sts., and Ohio River, Alleghenv.

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Represented at Boston by WETHERELL BROS., 31 Oliver St.; at Philadelphia by JAMES C. HAND & CO., 614 and 616 Market St.; at Cleveland by CONDIT, WICK & CO., 153 Water St.

TROY STEEL AND IRON CO.,

TROY, N. Y., Manufacturers of

BESSEMER STEEL RAILS,

Fish Plates, Bolts, Nuts, Spikes, &c. Machinery

Steel, Merchant and Ship Iron.

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Sole Manufacturers of **"CHOICE"** *EXTRA CAST STEEL.*

MANUFACTURERS OF

Warranted Best Cast Steel

FOR TOOLS AND DIES, AND

"CHOICE" EXTRA NEEDLE WIRE.

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CHAS. HUGILL, Agent.

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GENERAL AGENTS FOR

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PIG IRON, T AND STREET RAILS,

RAIL JOINTS AND SPIKES.

Bar Iron, Mine Car Wheels, Axles and Breaker Machinery.

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LIGHT RAILS A SPECIALTY.

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Automatic Inspirator

is acknowledged by all the leading mechanics and manufacturers to be

The Simplest, The Most Positive And Most Perfect In Use.

UNSURPASSED FOR

Stationary and Portable Engines.

Send for Catalogue and Price List.

Morse Automatic Inspirator Co.,
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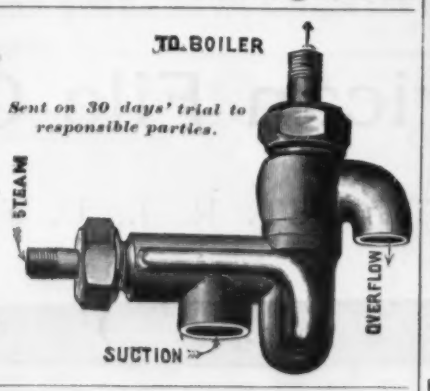
182 BANK ST., CLEVELAND, OHIO.

Sent on 30 days' trial to responsible parties.



Perkins Improved Toe Calks.

MANUFACTURED BY

RHODE ISLAND HORSE SHOE CO.,
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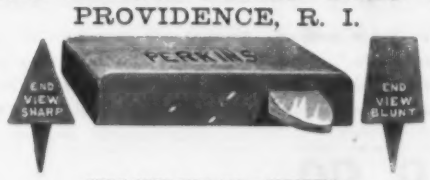
Made without Waste, and Sold at a Reasonable Price.



Prong does not Enter (and weaken) the Shoe at the crease.

FULL SIZE CUT, NO. 0 MEDIUM.

Made in three lengths, viz., Short, Medium and Long, each pattern in a variety of sizes, both Blunt and Sharp. Patented Feb. 17, 1885. Prices quoted on application.

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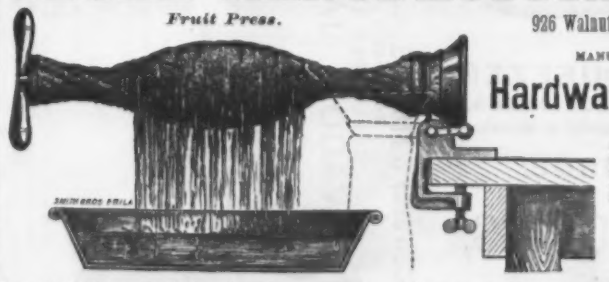

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Hardware Specialties

Combined Scales and Measures, Scissors Sharpener, Toasters, Sad Iron Heaters, Kitchen Utensils, Cake Mixers.

AGENTS WANTED.

Watch Changes.

New York Office, 71 Fulton Street, W. H. CAUGHEY, Agent.

Now is the time to make money handling these goods. Don't wait till every store has them.

R. MUSHET'S SPECIAL STEEL

FOR

LATHES, PLANERS, &c.,

Turns out at least DOUBLE WORK by increased speed and feed, and CUTS HARDER METALS than any other Steel. Neither hardening nor tempering required.

SOLE MAKERS,

SAMUEL OSBORN & CO
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Represented in the United States by

B. M. JONES & CO.,
Nos. 11 and 13 Oliver Street, - - BOSTON.

NAYLOR & CO.,

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IMPORTERS OF

STEEL AND IRON RAILS,
Steel Tires and Axles, Tin and Terne Plates.
Swedish and Norway Iron,
BESSEMER STEEL AND IRON
WIRE RODS.

Pig Iron, Spiegeleisen, Ferromanganese, Scrap Steel and Old Iron Rails.

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Manufacturers of

STEEL COMPRESSED SHAFTING.

"Benzon" Homogeneous Plates

FOR BOILERS, FIRE BOXES, &c.

SPRING STEEL

And all other kinds of

Martin-Siemens Steel and Iron.

The Iron-Masters' LABORATORY.

Exclusively for the

Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags and Coal for Practical Metallurgical Purposes.

No. 339 Walnut St., Philadelphia.

With Branch at Warrenton, Virginia,

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This laboratory was established in 1866, at the instance of a number of practical Iron Masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes, the object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

Cut one-half size.

"BRIER HILL PIG IRON."

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A. PARDEE & CO.,

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LEHIGH COALS

The following superior and well-known Lehigh Coals are mined by ourselves and firms connected with us, viz.:

A. Pardee & Co., { HAZLETON, CRANBURY, SUGAR LOAF.
Pardee, Bro. & Co., LATTIMER.
Calvin Pardee & Co., HOLLYWOOD.
Pardee, Sons & Co., MT. PLEASANT.

PHILADELPHIA.

Lloyd & Supplee Hardware Co.

Terms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ℔ ℔ .... 9½ @ 10¢
Trenton .... 9½¢
Eagle Anvils, American, 10¢ .... dis. 20 %

Apple Parers.
Penn Apple Parers .... 5.50 net
White Mountain 5.50
Lots of 10 to 25 dozen, special prices.

Axes.
Hunt's Kentucky and Yankee, ℔ doz. net $6.50@7.00
William Mann, ℔ doz. net .... 6.50@7.00
Favorite ℔ doz. net .... 5.50@6.00
Beveled Axes .... add 50¢
Double Bit Axes net $12.00

Augers and Auger Bits.—New List January 7, 1880.
Snell's Augers and Bits .... dis. 60@60&5 %
New Haven Copper Company .... dis. 60&10&5 %
Benjamin Pierce Auger Bits .... dis. 40 %
Jennings' Auger Bits, new list, Jan. 1, 1884. dis. 25 %
Cook's Auger Bits and Augers .... dis 55 %
Snell's Ship Augers .... dis 15 @ 20 %
Watrous' Ship Augers .... dis. 15 @ 20 %
Bonney's Pat. Hol. Augers, list $48 ℔ doz dis 33⅓@40 %
Stearns' Pat. Hol. Augers, list $48 ℔ doz ... dis. 20&10 %

Balances.
Light and Common .... dis. 40&10 %

Bells.
Bevin Bros. Mfg. Co. Light Hand Bells dis. 75&10@80 %
Light Hand Bells .... 80 %
Swiss Pattern Hand Bells .... 60 %
Connell's Door Bells .... dis. 20&10 %
Gt. Western & Kentucky Cow, new list .... dis. 70 %

Boring Machines
Upright, without Augers ..... List, $5.50 } .... dis. 50 %
Angular, without Augers ..... List, 6.75 }

Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 .... dis. 80&5@80&7½ %
Philadelphia Carriage Bolts new list. dis 75&10&80 %
Stanley, Wrought Shutter .... dis. 50, 10, 10&5 %

Braces.—Barber's Improved .... dis. 40@40&5 %
Barber's Old Style .... 50 %
Backus, Polished .... dis. 50&10@50&10&10 %
Backus, Nickeled .... dis. 50&10 %
Spofford .... dis. 50&5 %
American Ball .... dis. 55&10 %
Amidon Improved .... dis. 60@60&10&5 %
Amidon Corner Brace .... dis. 40 %

Butts.—Cast Fast Joint, Narrow .... dis. 60&10 %
Cast Fast Joint, Broad .... dis. 60&10 %
Cast Loose Joint, Narrow .... dis. 70&10 %
Cast Loose Joint, Broad .... dis. 70&10 %
Cast Acorn, Loose Pin .... dis. 70&10 %
Cast Acorn, Japanned .... dis. 70&10 %
Cast Mayer's Loose Joint .... dis. 70&10 %
Wrought Loose Pin ..... dis. 60&10&10@60&10&10&5 %
Wrought Table Hinges and Back Flaps .. dis. 60&10 @ 60&10&10 %
Wrought Loose Joint .. dis. 60&10&10@60&10&10&5 %
Wrought Narrow Fast .... dis. 60&10 @ 60&10&10 %

Blind Butts.
Parker .... dis. 75&2 %
Clark .... dis. 80 %
Shepard .... dis. 75&10&5 @ 80 %
Lull & Porter .... dis. 80&10 %
Huffer's .... dis. 50 %

Casters.—Bed (new list July 1, 1880) } dis. 60&5@60
Plate .... } &10 %

Chains.—German Halter and Coil, list June, 1884 .... dis. 55 @ 55&5 %
Galvanized Pump .... ℔ ℔ 5¾@6¼¢ net
Best Proof Coil Chain—English.

℔ ℔	9¾	6¾	5¾	5¼	5	4¾
	3-16	¼	5-16	⅜	7-16	½

Chisels.—Socket Framing .... dis 75&10@75&10&5 %
Socket Firmer .... dis 75&10@75&10&5 %
Butcher's .... $5.00@$5.25 to £ gold

Coffee Mills.—Box and Side (new list Jan. 1, 1880 .... dis 40 @ 40&10 %
Enterprise .... dis 20&10 %

Cutlery.—Walden Pocket .... new list net
Pennsylvania Knife Co .... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.

Door Hangers.—Cronk Barn Door Hangers ... No. 4, $12.00; No. 5, $14.00; No. 6, $18..00. dis. 50&5@50&10 %

Drawing Knives.
Bart Mfg. Co.'s .... dis. 75&10@75&10&5 %
Adjustable Handle .... dis 20@20&5 %

Fry Pans.
Tinned .... dis 45 %

℔ doz...	$3.50	4.00	4.50	5.00	5.50	6.50	7.50	9.00	10.00
No.....	0	1	2	3	4	5	6	7	8

Burnished .... dis. 70@70&5 %

℔ doz....	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00
No..	0	1	2	3	4	5	6	7	8

Files.
Nicholson .... dis 60@60&10 %
Disston .... dis 60@60&10 %
Butcher ....
Crown and Arrow .... 60&5@60&10 %

Fluting Machines.
Eagle—3¼ in. roll .... each, $2.15 } dis 35 %
Eagle—5¼ in. roll .... each, 2.85 }
Crown—4½ in. roll .... each, 3.50 }
Crown—6 in. roll .... each, 4.00 } dis 35 %
Crown—8 in. roll .... each, 6.50 }
Geneva Fluter .... dis 25 %
Favorite com. Fluter and Sad Iron .. ℔ doz., $10.50 net

Hammers.
Yerkes & Plumb's, new list .... dis 40&10 %
Maydole Hammers .... dis 15&10 %
Howell A. E. Nail Hammers .... ℔ doz., net $3.75

Handles.
Disston Loop Handles Cross-Cut .... 33¢ pair net
Boynton Loop Handles Cross-Cut .... 22¢ pair net

Hatchets.
Yerkes & Plumb, new list .... dis 40&10&5 %
Hunt .... dis 40 %

Hay and Straw Knives.
Lightning .... ℔ doz., $18.00 dis. 10@10&10 %
Electric .... ℔ doz., $12.50 net.
Wadsworth .... ℔ doz., net 35&5 %
Walton Straw Knives .... ℔ doz., net 17.00

Hinges.
Strap and T .... dis 65&10 %

Horse Nails. Nos.	5	6	7	8	9	10	
Globe	26	23	21	20	19	18	dis 10&5&5 %
Ausable	30	27	25	24	23	22	dis 25&10 %
Pol'ed and P't'd & Blued & P't'd	31	28	26	25	24	23	dis 25&10 %
Clinton		23	21	20	19	18	dis 25&10 %
" Pol'ed & P't'd		24	22	21	20	19	dis 25&10 %
Saranac	26	23	21	20	19	18	dis 20 %

Locks and Knobs.
Branford Locks .... 66⅔&2 %
Gaylord Cabinet .... dis 40&2 %
Parker's Cabinet .... dis 40&2 %
American Padlocks .... dis 66⅔&2 %
Scandinavian Padlocks .... dis 50 %

℔ doz..	$5.00	5.50	6.50	7.50	8.50	10.00	12.50	dis 60 %
No.....	57	58	59	60	61	62	63	
℔ doz		$18.00		26.00		33.00		dis 60 %
No		64		65		66		

Lanterns.
Buckeye .... large list, net; small list, net
Tubular .... No. 0, $7.50; No. 1, $9.00 ℔ doz. net
Guards 40¢ extra.

Lawn Mowers.—Pennsylvania } 40&10&3 % cash 30 days.
Philadelphia
Excelsior
Continental
Quaker City

Lawn and Garden Pumps.
Holland Patent .... list, $5.00, dis 10 %

Mattocks.
Long and Short Cutter .... new list, 60&10 %
Pennsylvania Pattern .... dis 60& 10 %

Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets. dis. 20&10 %
Stebbins' Gates .... dis. 75@75&5 %
Lincoln's Gates .... dis. 70&10 %
Landers, Frary & Clark's Petroleum .... dis 33⅓&10 %
Brass Liquor Cocks new list Jan. 1, 1880. dis. 55&5 %
Cork Lined Cocks .... dis. 70 %

Meat Cutters.
Dixon's .... dis. 40 %
Woodruff .... dis. 40 %
Stowe .... dis. 40 %
Hale's .... new list. dis. 60, 10&2 cash
American .... dis 35 %
Stuffers .... dis. 40 %
Enterprise Stuffers .... dis. 20&10 %

Planes.—Sandusky Tool Co .... dis. 20&2 %
Ogontz .... dis. 25&2 %
Ohio and Auburn .... dis. 20&2 %
Bailey (S. R. & L. Co.) .... dis. 20&10 %

Plane Irons.—Ohio Tool Co .... dis. 20&10 %
Butcher's .... $5.00 @ 5.25 to £

Plumbs and Levels.
Stanley's Adjustable .... dis. 70&10 %
Stanley's Non-Adjustable .... dis. 70&10 %

Picks.—New list .... 60&5@60&10 %

Razor Strops.
Lamont Combination .... ℔ doz. $4.00
Lamont Combination .... 1 gross lots $42.00
Imitation Emerson .... ℔ doz. $2.00
Lamoille, 1 doz. lots .... $3.50 net
" 1 gro. " .... $38.00 net

Rules.—Stanley Boxwood .... dis. 80&5@80 &10 %
Stanley Ivory .... dis. 55 @55&10%

Steelyards.—Hart's Pattern dis .... 40&10@50 %

Per doz......	$14.50	17.75	21.00	26.50	31.00	35.50
Lbs	50	100	150	200	250	300

American Pattern .... dis. 40&10@50 %

Per doz.......	$8.00	10.25	13.75	15.60	16.75	19.50
Lbs	50	100	150	200	250	300

Scale Beams .... 60&5@60&10%
Custers .... 25 %

Squares.
Steel and Iron. dis. 60&10 %; full cases dis. 60&10&10 %
Try Squares, Stanley .... dis 60&10 %
Disston's Try Squares .... dis 45&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened .... ℔ doz $9.00 } 33⅓
Clipper No. 10, Bronzed Blade, Boxed and Sharpened .... ℔ doz $8.50 }
Clipper No. 5, Painted Red, Boxed and Sharpened .... ℔ doz $8.00 }

Saws.—Disston's Hand, Panel and Rip .... dis 20&10 %
Disston's Circular .... dis 45&10 %
Cross-Cut No. 2, Plain Tooth .... dis 45&10 %
Cross-Cut Patent Tooth .... dis 45&10 %
Cross-Cut Champion Tooth .... dis 45&10 %

Shovels and Spades.
Oliver Ames & Sons, new list .... dis 20 %
Griffiths .... dis 50&10@60 %
Rowland .... dis 60&5@60&10 %

Sad Irons.—4 to 10 ℔ .... ℔ ℔ 2¼@2½¢
Mrs. Potts' Patent .... dis 40 %

Stone.
Washita Extra .... ℔ ℔ 17@18¢
Washita No. 1 .... ℔ ℔ 14@14½¢
Washita No. 2 .... ℔ ℔ 11¼@11½¢
Washita Slips .... ℔ ℔ 28&29¢
Washita Axe .... ℔ ℔ 14¢ net
Hindostan Oil Stone No. 1 .... ℔ ℔ 3¼¢
Hindostan Axe Stone .... ℔ ℔ 8¢. dis. 40 %
Hindostan Slips .... ℔ ℔ 10¢. dis. 40 %

Screws.—Parker List.
Flat Head Iron .... dis 85 %
Flat Head Brass .... dis 85 %
Round Head Brass .... dis 83⅓ %
Round Head Iron .... dis 83⅓%

Spoons.
Plated .... dis 50&10 %
German Silver .... dis 40&10@50 %
Britannia, Boardman's .... dis 60 %
Britannia, Parker's .... dis 60&10 %
Tinned .... dis 10 %

Springs.—Torrey .... dis 50 %
Gem No. 3 small Japanned .... $2.00 } dis 50&10 %
Gem No. 2 medium Japanned .... 2.75 }
Coil No. 10 ℔ gross net .... $5.50@6.00
Other Standard Springs .... dis 50&10@60 %
Warner Door Springs, ℔ doz. $2.50 .... dis 40&10 %
Standard Spring Hinges—
Single No. 0, ℔ doz. net .... $1.10@1.25
Single No. 1, ℔ doz. net .... 1.25@1.50
Other Standard Spring Hinges ..... dis 25&10@40 %

Stocks and Dies. .... dis 10 and 5 %

Stove Polish.—Gem .... ℔ gross, $4.50, dis 5 %
Dixon .... 6.00, dis 10 %
Fire Fly .... $3.00 gross. net

Tacks. .... Combination discounts
Shoe Nails—4-8, and over, 5½¢ } 10 %
Shoe Nails—3½-8, and under 7¢ }
Double Pointed Tacks .... dis 75&10 @ 75&10&5 %

Traps.
Genuine Oneida—Newhouse .... dis 35 %
Im. Oneida—Newhouse list. First qual. dis 60&10&10 %

Vises.—Solid Box. Trenton new list .. dis 50&10@60 %

Wrenches.—Agricultural .... dis 75&10&5 %
Coes' Genuine .... dis 60&3 %
Coes' Mechanics' .... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar .... dis 80 @ 80&5 %

Wire.
Bright or Annealed, No. 0 to 18 .... dis 70 %
Bright or Annealed, No. 19 to 26 .... dis 70 %
Bright or Annealed, No. 27 to 36 .... dis 75 %
Coppered, 0 to 18 .... dis 65 %
Tinned Broom Wire .... dis 65 %
Galvanized Barb Wire .... 5½¢
Painted Barb Wire .... 4½¢
Galvanized, No. 7 to 18 ... Market List, dis .... 60 %

Wringers.
Peerless No. 2½ .... $30.00 }
Peerless No. 2 .... 33.00 }
Universal No. 2½ .... 30.00 }
Universal No. 2 .... 33.00 } dozen lots $3.00 per dozen.
Novelty No. 2, for common tubs ... 30.00 }
Novelty No. 3, " " ... 34.50 }
Excelsior E, for stationary tubs ... 39.00 }
Excelsior F " " ... 43.50 }

PITTSBURGH.

Merchant Iron.

TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℔ cent. for cash, if remitted within 10 days from date of invoice.

For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.

The following are card rates.

Flat Bar.
1¼ to 4 by ⅜ to 1 inch .... 2.0¢
4¼ to 6 by ⅜ to 1 " .... 2.1¢
1¼ to 6 by 1⅛ to 1¼ " .... 2.4¢
1¼ and 1⅛ by ⅜ to ¾ " .... 2.1¢
1 and 1⅛ by ⅜ to ¾ " .... 2.2¢
⅝, ¾ and ⅞ by ⅜ to ⅝ inch .... 2.4¢

Rounds and Squares.
1 to 1⅝ .... 2.0¢ | ⅜ to 9-16 .... 2.2¢
2 to 2⅝ .... 2.2¢ | ½ to 7-16 .... 2.4¢
2¾ to 3¼ .... 2.5¢ | ⅜ .... 2.6¢
3⅜ to 4 .... 3.0¢ | 5-16 .... 2.8¢
4¼ to 5 .... 3.5¢ | ¼ .... 3.0¢
⅝ to ⅞ .... 2.1¢ | 3-16 .... 5.0¢

Oval Iron.
⅞ to 1⅛ .... 2.4¢ | ½ .... 2.8¢
⅝ to ¾ .... 2.6¢ | ⅜ .... 3.2¢

Half Oval and Half Round.
⅞ to 1⅛ inch .... 2.7¢ | ⅜ inch .... 3.5¢
⅝ to ¾ " .... 3.2¢ | ⅜ " .... 5.0¢

Horse Shoe.
⅝ to 1⅛ by 5-16 to ⅞ inch .... 3.0¢

Wagon Box Iron.
⅞ inch, Nos. 13 and 14 .... 3.2¢
⅞ " " 11 and 12 .... 3.0¢
¾ " " 13 and 14 .... 3.5¢
¾ " " 11 and 12 .... 3.3¢
⅝ " " 13 and 14 .... 3.9¢
⅝ " " 11 and 12 .... 3.6¢

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch .... 2.2¢
1½ to 3½ by ¼ and 5-16 " .... 2.2¢
1 to 1⅜ by ¼ and 5-16 " .... 2.3¢
¾ to ⅞ by ¼ and 5-16 " .... 2.5¢
⅝ and ⅝ by ¼ and 5-16 " .... 3.0¢

Light Bands.
1¼ to 6 by ⅛ to 3-16 .... 2.5¢
1½ to 6 by Nos. 11 and 12 .... 2.6¢
1 to 1⅜ by ⅛ to 3-16 .... 2.6¢
1 to 1⅜ by Nos. 11 and 12 .... 2.7¢
⅞ and 13-16 by ⅛ to 3-16 .... 2.9¢
⅞ and 13-16 by Nos. 11 and 12 .... 3.0¢
¾ and 11-16 by ⅛ to 3-16 .... 3.2¢
¾ and 11-16 by Nos. 11 and 12 .... 3.3¢
⅝ and 9-16 by ⅛ to 3-16 .... 3.5¢
⅝ and 9-16 by Nos. 11 and 12 .... 3.6¢
½ inch by ⅛ and 3-16 .... 3.8¢
½ inch by Nos. 11 and 12 .... 3.9¢

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 .... 2.8¢
1¼ to 2, Nos. 16, 17 and 18 .... 2.9¢
1¼ to 2, No. 19 .... 3.0¢
1¼ to 2, No. 20 .... 3.1¢
1¼ to 2, No. 21 .... 3.2¢
1¼ to 2, No. 22 .... 3.3¢
15-16, 1, and 1⅛, Nos. 13, 14 and 15 .... 3.0¢
15-16, 1, and 1⅛, Nos. 16, 17 and 18 .... 3.1¢
15-16, 1, and 1⅛, Nos. 19 and 20 .... 3.2¢
15-16, 1, and 1⅛, No. 21 .... 3.3¢
15-16, 1, and 1⅛, No. 22 .... 3.4¢
⅞, Nos. 13, 14 and 15 .... 3.2¢
⅞, Nos. 16, 17 and 18 .... 3.3¢
⅞, Nos. 19 and 20 .... 3.4¢
⅞, No. 21 .... 3.5¢
⅞, No. 22 .... 3.6¢
13-16, Nos. 13, 14 and 15 .... 3.4¢
13-16, Nos. 16, 17 and 18 .... 3.5¢
13-16, Nos. 19 and 20 .... 3.6¢
13-16, No. 21 .... 3.7¢
13-16, No. 22 .... 3.8¢
¾, Nos. 13, 14 and 15 .... 3.5¢
¾, Nos. 16, 17 and 18 .... 3.6¢
¾, Nos. 19 and 20 .... 3.7¢
¾, No. 21 .... 3.8¢
¾, No. 22 .... 3.9¢
11-16, Nos. 13, 14 and 15 .... 3.7¢
11-16, Nos. 16, 17 and 18 .... 3.8¢
11-16, Nos. 19 and 20 .... 3.9¢
11-16, No. 21 .... 4.0¢
11-16, No. 22 .... 4.1¢
⅝, Nos. 13, 14 and 15 .... 3.9¢
⅝, Nos. 16, 17 and 18 .... 4.0¢
⅝, Nos. 19 and 20 .... 4.1¢
⅝, No. 21 .... 4.2¢
⅝, No. 22 .... 4.3¢
⅝, No. 23 .... 4.4¢
9-16, Nos. 13, 14 and 15 .... 4.1¢
9-16, Nos. 16, 17 and 18 .... 4.2¢
9-16, Nos. 19 and 20 .... 4.3¢
9-16, No. 21 .... 4.4¢
9-16, No. 22 .... 4.5¢
9-16, No. 23 .... 4.6¢
½ inch, Nos. 13, 14 and 15 .... 4.3¢
½ inch, Nos. 16, 17 and 18 .... 4.4¢
½ inch, Nos. 19 and 20 .... 4.6¢
½ inch, No. 21 .... 4.7¢
½ inch, No. 22 .... 4.8¢
½ inch, No. 23 .... 4.9¢

The prices under Hoop Iron do not apply to Cotton Ties.

1-10¢ ℔ ℔ extra will be charged for each gauge lighter than the lightest indicated.

1-10¢ ℔ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 ℔, ℔ set of 6 hoops .... 3.0¢
8 ℔ and less than 9 ℔, ℔ set of 6 hoops .... 3.1¢
Less than — ℔, ℔ set of 6 hoops .... 3.2¢

Extras for Cutting to Length all Preceding Iron.
All Iron, including Tire .... 1.10¢

Tank Iron.
No. 9 and heavier .... 2.8¢
Plow Slabs .... 3.0¢
Plow Wings .... 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.5¢	6.0¢
Nos. 15 to 17	3.3¢	4.8¢	6.3¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.6¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.
1st quality (A) .... 10¢ | 2d quality (B) .... 9¢
Galvanized C. H. B.—(Charcoal Hammered Blooms.)
Nos. 14 to 20 .... 12¢ | No. 27 .... 15¢
Nos. 21 to 24 .... 13¢ | No. 28 .... 16¢
Nos. 25 and 26 .... 14¢ | No. 29 .... 18¢
57 @ 60 % discount.

Coal Screen Iron.
1¼ by ⅜ by 5-16 .... 2.5¢ | 1 by ⅜ by 5-16 .... 3.0¢

Angle Iron.
2¼, 3, 3½ and 4 inch .... 2.8¢
1½, 1¾, 2 and 2¼ " .... 2.8¢
1¼ inch .... 2.9¢
1 " .... 3.1¢
1¼ by 1 inch, for Plow Handles .... 3.3¢
1⅛ by ¾ " " " .... 3.3¢
1⅜ by ⅝ " " " .... 3.4¢

T Rail.
8 lbs. to the yard ..... 2.4¢ | 20 lbs. to the yard ..... 2.3¢
12 " " ..... 2.3¢ | 25 " " ..... 2.3¢
16 " " ..... 2.3¢ | 30 " " ..... 2.3¢

Splice Joints for 12, 16 and 20℔. Rail, 30¢ each; 25 and 30-℔. Rail, 40¢ each; 40-℔., 50¢ each.
3½ by ⅜ and ½ Spikes for 20 and 25-℔. Rail .... 3¼¢
2½ and 3 by ⅜ " " 12 and 16-℔. " .... 3.5¢
2½ by 5-16 " " 8-℔. Rail .... 4.0¢

Flat Rails.—Punched and Countersunk.
1¼ to 2 by ½ to ⅝ inch .... 2.5¢
1¼ by ⅜ and 7-16 inch .... 2.7¢
1¼ by ⅜, 7-16 and ¼ inch .... 3.0¢

Juniata Nail Rods .... 6.0¢
Norway Nail Rods .... 7.5¢
Guard Iron, ¾x⅜x⅜ and ⅞x⅜x⅜ .... 3.5¢
Guard Iron ⅝x⅜x9-16 and ½x⅜x⅜ .... 3.7¢
Drag Bars .... 2.8¢
Dropper Bars .... 3.3¢
Cylinder and Landside Iron .... 2.7¢
Plow Beam Iron .... 2.5¢

Nails.

See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.

Square, Flat, Octagon and Round.
⅜ to 2 inches, inclusive .... 8½¢
1-16 and 2⅛ to 3 inches .... 9½¢
¼ and 3⅛ to 4 " .... 10½¢
7-32 and 4⅛ to 5 " .... 11½¢
3-16 and 5⅛ to 6 " .... 14¢
5-32 inch .... 18¢
⅛ " .... 25¢
Oil Well Steel Forgings .... 18¢

Machinery Steel.

	Crucible	Bessemer & Open Hearth.
Ordinary Sizes. ⅜ to 2 inch Round	4¢	3¢
5-16 and 2⅛ to 3 inches	5¢	4¢
¼ and 3⅛ to 6 "	6¢	5¢
7-32 inch	7¢	6¢
3-16 "	9c	8¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.
Crucible Cast Steel .... 5¢
Open Hearth Cast Steel .... 4¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	9¢	8¢	6¢	5¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.
Auger and Auger Bit .... 3¢
Axle Steel for carriages and wagons .... 3¢
Frog Points and Plates .... 5½¢
Frog Side Bars .... 5¢
Pick, plain (hammered) .... 5¢
Pick and Mattock, beveled (rolled .... 3¢
Skate Steel .... 4½¢
Table Cutlery, plain .... 3½¢
Table Cutlery, beveled .... 4¢
Pike and Cant Hook .... 7¢
Coal and Granite Wedge .... 7¢
Roller .... 5½¢
Spindle, subject to Machinery classification .... 5½¢
Trap Spring Steel .... 6¢
Forged Crank Pins and Lathe Spindles .... 7½¢
Piston Rods, plain .... 4¢
Piston Rods, forged to shapes .... 7½¢
Slide Bars, plain .... 5¢
Slide Bars, forged to shapes .... 7½¢

Open Hearth or Bessemer
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick .... 4¢
Boiler, Fire-Box and Flue Sheets, not less than ⅛ thick .... 5¢
Circulars and semi-circulars, when ordered separately .... 6¢
Smoke Stack, to shape .... 5¢
Locomotive Tank Steel .... 4¢

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8 inch and over ....
Mill Saw, 8-inch and over .... 5¢
Taper, 3½-inch and over .... 6¢
Horse and Shoe Rasp .... 5¢

Spring Cast Steel .... 4¢
Spiral, Taper, cut to lengths .... 5½¢

Tire Cast Steel.
1x¼ and over .... 6½¢
1x3-16, ⅞x3-16 and ¼ .... 7¢
1 and 13-16x¼ and 5-32, ¾x3-16 and 5-32 .... 9¢
¾ and ⅝x¼ and 3-32 and 12 g .... 10¢
Solid Safe Cast Steel .... 4¢
Three and Five Ply Cast Steel .... 5¢

Agricultural Implement Cast Steel.
Fork and Rake. Crucible .... 4½¢
Horse Rake Steel, cut to lengths. Crucible .... 5¢
Hoe. Crucible .... 5¢
Corn Stalk Cutter, beveled .... 4½¢
Beveled Hoe and Shovel Steel in Bars .... 4½¢
Crucible Plow Steel in Slabs .... 4½¢

Bessemer and Open Hearth.
Spring .... 2½¢
Spring spiral and taper, cut to lengths .... 3½¢
Tire, 2-16 thick and above .... 2½¢
Toe Calk .... 2½¢
Plow .... 2½¢
Axle Billets .... 2 ¢
Sleigh Shoe .... 2½¢
Cutter Shoe, cut to lengths and tapered .... 3¢
Scythe Back Steel .... 3½¢
Grain Drill Bars .... 2½¢
Grain Drill Points .... 3½¢
Rolling Coulter Blanks, cut and punched .... 6¢
Thrasher Steel .... 2½¢
Thrasher Teeth .... 3½¢
Rolled Hammer Billets .... 2½¢

Terms.—Four months · 3 per cent. discount for cash if remitted within 30 days.

Rolls and Castings.

Furnace Floor and Straightening Plates .... 1¼¢
Housings and Castings not otherwise specified .... 1¾¢
Guide Plates .... 2½¢
Spindles and Coupling Boxes .... 1¾¢
Sand Rolls and Pinions, large size .... 2 ¢
Sand Rolls and Pinions, small size .... 2½¢
Pipe Mill Castings .... 3 ¢
Rolling Mill Castings under 50 ℔ .... 2 ¢
Spur and Bevel Wheels, large .... 3¢
Spur and Bevel Wheels, small .... 3½¢
Pulleys up to 30 inches .... 4 ¢
Pulleys over 30 inches .... 3½¢
Engine Castings, light .... 3¼¢
Engine Castings, heavy .... 2¾¢

White and Red Lead.

Strictly Pure White Lead in Oil, in Kegs 6¼¢ ℔ ℔ · in 25℔ Cans, packed in 100 ℔ cases, ½¢, and 12½ ℔ cans' 1¢ over keg price; in 1 to 5 ℔ Cans, assorted, in 100 ℔ cases, 2½¢ over keg price.
Strictly Pure Dry White Lead in kegs .... 6¼¢ ℔ ℔
Strictly Pure Red Lead *extra bright and fine*, in kegs .... 6¼¢
Strictly Pure Litharge, *powdered, extra fine*, in kegs 6¼¢
Orange Mineral, *True*, in barrels .... 8¢
" " " in 100 ℔ kegs .... 8¼¢

A discount of 3% will be deducted from Invoice on purchase of 500 ℔ and upward.

Terms: Note or acceptance at 60 days; or less 2½ % for cash if paid within 15 days from date of invoice.

Freight equalized with all points where White Lead is made.

Window Glass.

Discount, 75% *Single Strength* 75 & 10% *Double*. Prices current, ℔ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	.
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	..	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	*21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
	36 x 60 to 40 x 60	33.25	30.00	27.75	....

Sizes above — $10 ℔ box extra for every 5 inches.

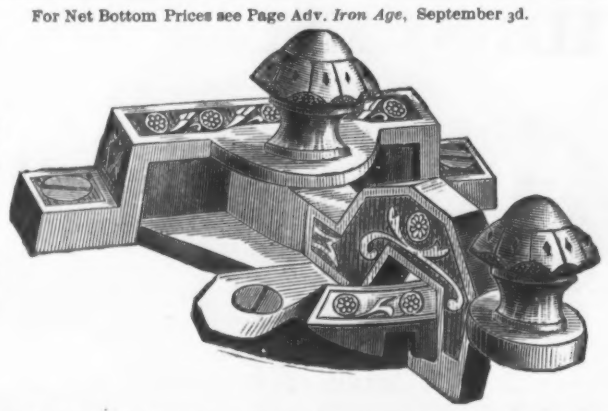
An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.

Axes, Single Bit, Lippincott .... per doz., $6.50
Axes, Single Bit, James & Co .... per doz., 5.50
Axes, Double Bit, Lippincott .... per doz., $12.00
Axes, Double Bit, James & Co .... per doz., 10.00
Drain Tools, list .... dis 20&7½ %
Hoes, Planters' .... dis 60 %
Hoes, Scovill Pattern .... dis 60 %
Hoes, Handled, Square Eye, German .... dis 60 %
Handles, Cross Cut .... per doz., $2.25
Handles, Shovel, Bent, Bored, Riveted .. per doz., 2.00
Saws, Circular .... dis 50 %
Saws, Long .... dis 45 %
Saws, Cross-Cut, H. B. & Co., Champion, per foot net $0.27
Saws, Cross-Cut, Lippincott, Champion, per foot net $0.25
Shovels, list .... dis 20&7½ %
Spades, list .... dis 20&7½ %
.... dis 20&7½ %

For Net Bottom Prices see Page Adv. *Iron Age*, September 3d.

BROUGHTON'S
BURGLAR-PROOF SASH LOCKS.
(Patented Oct. 7th, 1879.)
FOR NET BOTTOM PRICES SEE PAGE AD. IN IRON AGE JUNE 25.

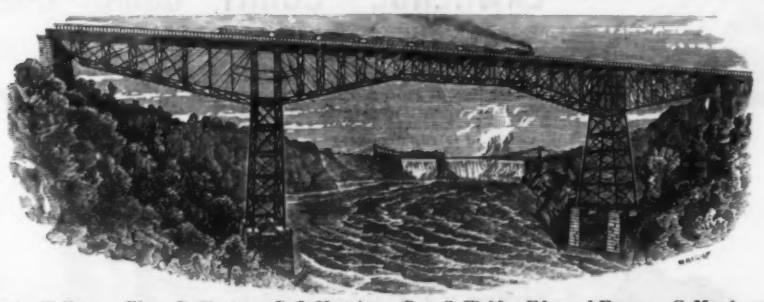


No. 210, Ornamental Iron, Iron Knob, fine finish, Etruscan Bronze	$0.60	No. 217, Ornamental Iron, Iron Knob, Nickel-plated, Crimson Old Gold inlaid	1.85
No. 211, Ornamental Iron, Iron Knob, fine finish, Olympian Bronze	.75	No. 218, Ornamental Iron, Iron Knob, Nickel-plated, Blue Old Gold inlaid	1.90
No. 212, Ornamental Iron, Iron Knob, fine finish, Pompeii Bronze	.85	No. 219, Ornamental Iron, Iron Knob, Nickel-plated, Green Old Gold inlaid	1.95
No. 213, Ornamental Iron, Iron Knob, Nickel-plated	1.25	No. 220, Ornamental Iron, Iron Knob, Nickel-plated, Copper Old Gold inlaid	2.00
No. 214, Ornamental Iron, Iron Knob, Nickel-Plated Rich Old Gold inlaid	1.50	No. 221, Ornamental Iron, Iron Knob, Nickel-plated, Lemon Old Gold inlaid	2.05
No. 215, Ornamental Iron, Iron Knob, Nickel-plated, Pale Old Gold inlaid	1.60	No. 222, Ornamental Cast Brass, Polished and Lacquered	2.65
No. 216, Ornamental Iron, Iron Knob, Nickel-plated, Fire Old Gold inlaid	1.75	No 223, Ornamental Cast Brass, Nickel-plated	3.60

MANHATTAN HARDWARE CO.,
READING, PA., U. S. A.,
MANUFACTURERS OF
LOCKS of Every Description,
AND A FULL LINE OF
GENERAL BUILDERS' HARDWARE.

Special net prices to be found in *Iron Age* whenever changes occur.
The only manufacturers in the United States who quote bottom prices to all dealers without favoring any class.
Fine Gray Iron Castings of every description, also Real Bronze and Brass Castings, made to order at very low prices; Pattern Making, Japanning, Bronzing, Tinning, &c.
Our goods are known and liked wherever sold.
Orders received will be filled at last prices quoted in *The Iron Age*.
We do no underhand business, but quote alike to all for quantities less than $1000.
Our terms are strictly 15 days, f. o. b. Reading, no charge for cases or cartage.

UNION BRIDGE COMPANY.



Charles Kellogg. Thos. C. Clarke. C. S. Maurice. Geo. S. Field. Edmund Hayes. C. Macdonald.

CIVIL ENGINEERS

And Constructors of Iron and Steel Bridges, Viaducts, Roofs, Elevated Railroads, Marine Piers, Etc.

Works: Athens, Pa. Late Kellogg & Maurice.) Capacity, 14,000 tons.
Works: Buffalo, N. Y. (Late Central Bridge Works.) Capacity, 12,000 tons

DESIGNS AND ESTIMATES WILL BE SENT ON APPLICATION TO
UNION BRIDGE COMPANY, 18 Broadway, New York.

Steel Door Hangers
FOR EVERY PURPOSE.

Anti-friction Steel Barn Door Hangers.
Three sizes of Steel Common Hangers.
Anti-friction Steel House Door Hangers.
Heavy and Extra Heavy Anti friction Hangers for Warehouses, Freight Depots, &c.
Anti-friction Steel Elevator Hangers for Iron or Wooden Doors.
Special shapes and sizes of Hangers made to order.
All Hangers made for either Iron or Wood Track.
Wrought-Iron, Lock-Joint, Round-Edge Hanger Track in any desired lengths and sizes.
Track Brackets, Stay Rollers, Combination Latches, Automatic Gate Hinges.
The most complete and finest line of these goods manufactured.
Prices the lowest. Catalogues and Lists on application.

SCRANTON MFG. CO., 68 to 74 W. Monroe St., Chicago.
BRAINERD & CO., Eastern Agents, 97 Chambers St., New York.

ROOT'S HANDY CLOTH-BOUND
HARDWARE PRICE CARDS,
For Either Wholesale or Retail Trade.

COPYRIGHTED 1885.

These Cards have only been in print *one month* and have already reached a *Second Edition* on several numbers. They cover the lines having a large variety of sizes or numbers, avoid marking each package or article, in Retail Stores, and are very convenient for use in Wholesale Sample Rooms. They secure correct and uniform selling prices, save time, and no Hardware Dealer can afford to do without them. They are printed in *very distinct type*, on the best *Ledger Paper*, appropriately ruled with blue ink cross lines and red ink down rulings, for noting in pencil—*List, Cost, Jobbing and Selling Prices*. They are mounted on both sides of a tough, heavy card-board, especially adapted for this use, which is further protected on the four edges by being *cloth-bound*. Two-THIRDS of them are 3 x 13½ inches. This size has been found convenient for hanging on any narrow surface, without hiding the goods. In the top of each Card a nickel-plated eyelet is firmly inserted.

PRICES IN SETS.

Set No. 1.	Includes all the numbers, 1 to 32 inclusive	Price, $10.00	per Set.
Set No. 2.	Omits Cards Nos. 25, 26, 27, and includes all the other numbers described above	" 8.00	"
Set No. 3.	For Dealers in Tinware and House Furnishing Goods, consists of Cards Nos. 25, 26, 27	" 2.00	"
Set No. 4.	Includes the following Eighteen Leading Cards for Retail Trade: Nos. 2, 3, 9, 10, 11, 12, 13, 14, 15, 18, 19, 20, 22, 23, 24, 28, 31, 32	" 5.00	"

☞ Write for a Circular giving detailed description and Price of each Card. They are sold separately at prices ranging from *Twenty to Seventy Cents Each*. Twenty numbers out of the Thirty-two are *Thirty Cents Each*. Unmounted Price Sheets can be furnished at *half* the Price of Mounted. Postage stamps can be enclos d for *Sample* cards or amounts of less than One Dollar. Full sets will be sent, subject to approval, to parties willing to prepay return charges on any numbers not suited to their use.

SENT, CHARGES PREPAID, ON RECEIPT OF PRICE, BY
T. W. ROOT, - Detroit, Mich.
Or DAVID WILLIAMS, 83 Reade St., New York.

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W. L. STRONG, *President*. A. D. JUILLIARD, *Vice-President*. C. P. WHITNEY, *Secretary*.
R. W. ABORN, *Treasurer*. JOHN B. POWELL, *Gen'l Manager*.

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Where Electric Apparatus for all the various modes of lighting and transmitting of Power are in operation. **No other** system is as **economical** in Instalation and Maintenance. **No other** Electric Light is as **durable**—the first machines made are still in daily operation.

The System Comprises
- Arc Lights of various sizes.
- Arc and Incandescent Lights from one Dynamo and Circuit.
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Cost of Apparatus greatly reduced. *Surveys and Estimates by experts.*

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SOMETHING NEW.
Ball Bearing and Ratchet Movement.
Most Easy for Beginners. Best for Experts.

Rink Skate. Club Skate.

MANUFACTURED BY
EUREKA SKATE CO., Richmond, Ind.
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Ice Cutting Machine.

We are aware that there are imperfect imitations of our machine in the market, and would ask your especial attention to the fact that the practical value of any Ice Machine consists in the **curved or off-set teeth,** through which the ice will readily pass by its own weight. This feature is fully protected by our letters patent, and cannot be used in any other machine.

GEO. H. MOSEMAN & CO.
Sole Agents,
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THE BEST POINT IN THE MARKET.
Our Goods are Warranted Perfect.
WRITE FOR PRICES.
J. T. GILMORE & SON, Painesville, Ohio.

Dog Collars,
Dog Muzzles,
Dog Whips,
Dog Combs,
Dog Brushes,
Dog Bells,
Dog Couplings,
And all Styles of Dog Furnishings.

Send for Catalogue and Discount Sheet.

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101 Chambers St., New York.
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Pike Station, New Hampshire, U. S. A.
Cable Address, "Pike, Haverhill."
MANUFACTURERS AND WHOLESALE DEALERS IN
BLUE STONE.
The Largest Manufacturers and Dealers in Stones for Sharpening all Edge Tools.

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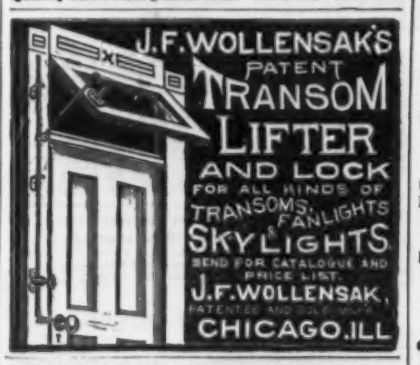
In fact, everything that is used for sharpening Edge Tools supplied in any grit or shape required. Quality and Prices guaranteed. Send in your orders.



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READY ADDRESSED
ENVELOPES AND WRAPPERS FOR ALL LINES OF TRADE
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119 CLARK STREET CHICAGO, ILL.

MALLEABLE CASTINGS.
New Process. Air Furnace.
JAMES L. HAVEN & CO.,
CINCINNATI, OHIO.

BOSTON.
Reported by Bigelow & Dowse.

Anvil & Vise.—

	10	20	30	40	
Cheney	$3.50	4.50	5.50	6.50	dis 25 %

Eagle, Fisher & Norris. No. 00, $1.75; 0, $2.25; 1, $2.75; 2, $3.25; 3, $4.00; 4, $4.50; 5, $5.25; 6, $6.00; 7, $6.50; 8, $7.25; 9, $8.25.
100 ℔ and over 10¢ ℔ dis. 20 %

Augers & Bitts.—
L'Hommedieu's Ship Auger dis 15 %
Jenning's Bitts dis 25 %
Cook's Bitts dis 50 %
Shepardson's Double-Cut Bitts dis 45 %
Shepardson's Double Gimlets dis 40 %
Stearn's Extension Hollow Augers—
No. 2, ₱ dox., $48; No. 3, ₱ dox., $60 list dis 20 %
Bonney's Extension Hollow Augers ₱ dox $36.00
Pierce's Bitts dis 50 %
Griswold Bitts dis 60&10 %

Axes.—Blue Jackets ₱ dox $7.50
Dowse Handled Boys' dis 35 %

Ax Handles.—

Oak Extra, 31 in., No. A	₱ dox $2.50
Oak Extra, 34 in., No. A	₱ dox 2.50
Oak Extra, 31 in., No. B	₱ dox 2.00
Oak Extra, 34 in., No. B	₱ dox 2.00
Oak Extra, 31 or 34 in., No. C	₱ dox 1.40

Axle Clips dis 50 %
Balances.—Chatillon's dis 40 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers) ₱ ft., 2¢
Cast Half Round ₱ ft., ⅜, 2½¢; ½, 3¢
Wrought Round ₱ ft., ⅜, 3¢; ½, 4¢; ⅝, 5¢
Bells.—Connel's Crank Gong, reduced list dis 20&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879 dis 40 %
Brass M. B. & D. reduced list, 1879 dis 33⅓ %
Blind Fasts.
No. 6 Fasts ₱ C sets 6.00
Shedd's ₱ C sets 6.50
Blind Hinges.—Mall. Hook, 3 holes ₱ C sets 7.00
Blocks.—Tackle dis 20 %
Brad Awl Handles.—
Phœnix Adjustable ₱ dox $2.00
Belts.—Norway Iron Carriage dis 75 %
Common Carriage, new list dis 75&10 %
Eagle Carriage dis 75 %
Borax.—Refined ₱ ℔ 13¢
Boring Machines.—
Eagle Upright, each $5.50 list } dis 50 %
Eagle Angle, each 6.75 list }
Braces.—Barber's dis50 %
Spofford's dis 50&5 %
Backus's
Bracket Saws.—Holly Scroll Saw each $2.25
Bracket Saws, extra quality, to No. 5 ₱ gro. 0.75
Steel Frame, with patterns ₱ dox 6.00
Lester dis 20 %
New Rogers, all iron dis 25 %
Bracket Saw Blades.—Griffith's pat., ₱ gross 75¢
Brackets.—
P. S. & W. Flower Pot, reduced list dis 40&10 %
Bronzed Shelf M. B. & D., new list dis 50&10 %
Store Shelf dis 40&10 %
Butts.—Union Fast Joint dis 60&10 %
Union Loose Joints dis 70&10 %
Union Japanned Acorn dis 70&10 %
Union Silvered Acorn dis 70&10 %
Union Boston Finish dis 75&10 %
Union Spiral Spring dis 25&10 %
Wrought Brass dis 70 %
Carriage Bolts.—Eagle Norway dis 75 %
Common, new list dis 70&10 %
Carriage Jacks.—Climax No. 1 ₱ dox $30.00
Climax No. 1½ ₱ dox 15.00
Climax No. 2 ₱ dox 13.50
Universal dis 25 %
Universal No. 1 each $2.00
Universal No. 2 each 3.00
Universal No. 3 each 6.00
Universal No. 4 each 6.00
Universal No. 5 each 6.50
Cartridges.—U. S. Cartridge Co. dis 60&10 %
Cards
Watson's make Horse & Curry dis 10 % } Rev. List.
Watson's Cotton dis 10 % } Aug., 1883.
Watson's Wool dis 10 % }
Casters.—Bed and Table dis 50&10 %
Chain.
Coil 5-16 ₱ ℔ 9¢
Coil ¼ ₱ ℔ 7¢
Coil 5-16 ₱ ℔ 6¢
Coil ⅜ ₱ ℔ 5¢
Coil 7-16 ₱ ℔ 5¢
Coil ½ ₱ ℔ 5¢
Chalk.—White, Carpenter's ₱ gross 60¢
Red, Carpenter's ₱ gross 80¢
Blue, Carpenter's ₱ gross $1.00
Crayons 12¢
Chisels.—Peck, Stow & Wilcox dis 70&10 %
Underhill, Framing dis 35 %
Buck's Chisels dis 30 %
Coal Hods.—Galv'd, New List dis 60 & 10 %
Japanned, New List dis 60 & 10 %
Cocks.—Brass. L. F. & Co. dis 50&10 %
Coffee Mills.—New List dis 40 %
Copper Rivets.— dis 50 %
Cordage.—Manila, usual trade dis 1¢ ₱ ℔ 13½¢
Jute ₱ ℔ 7¢
Cow Ties. dis 50 %
No. 30, 3 ft. No. 6 Wire, with toggle ₱ dox $3.80
No. 35, 3 ft. No. 6 Wire, with snap ₱ dox 4.00
No. 40, 3½ ft. No. 6 Wire, with toggle ₱ dox 4.30
No. 45, 3½ ft. No. 6 Wire, with snap ₱ dox 4.50
No. 50, 4 ft. No. 4 Wire, with toggle ₱ dox 4.75
No. 55, 4 ft. No. 4 Wire, with snap ₱ dox 5.00
No. 60, 4½ ft. No. 3 Wire, with toggle ₱ dox 5.60
No. 65, 4½ ft. No. 3 Wire, with snap ₱ dox 5.80
Crow Bars.—Cas Steel ₱ ℔ 6¢

Cutlery.—Pocket American Shear Co.'s dis 40 %
Butcher Knives, Wood's, Lap Bolster, Square Handle dis 40
Steak Knives dis 40 %
Lap Bolster, Oval Handle dis 40 %
Sticking dis 40 %
Skinning dis 40 %
Butcher, Common Round Handle, Wood's dis 40 %
Shoe Knives, Wood's dis 30 %
Dividers.—Cook's. dis 25
Dog Collars. dis 20 %
Door Springs.—Torrey Rod ₱ doz $1.62
Imitation Torrey's Rod ₱ doz 1.45
Gem Coil, new list dis 50&10 %
Crown ₱ doz $1.2
Warner's ₱ doz 1.75
Door Stops.—Thurston's dis 50 %
Drawer Knobs.—Thurston's dis 50 %
Drills.—Morse Bitt Stock } dis 40&10%
Morse Straight Shank }
Emery.—Wellington Mills ₱ ℔ 10¢
Walpole Emery Mills ₱ ℔ 5¢
Turkish, in 10 ℔ cans ₱ ℔ 7¢
Enameled Ware.—
Standard Mfg. Co. Kettles dis 60 %
Standard Sauce Pans dis 30 %
Felloe Plates.—Wrought ₱ ℔ 4
Files.—American File Co. dis 60 %
Nicholson File Co. dis 60 %
Fluting Machines.—Knox List, $4.00. dis 25 %
Forks.—W. C. & Co. dis 60 %
Eastern Tool Co.'s. Manure dis 60 %
Gimlet Bits.—
Genuine German, No. 125, 1-32 to 8-32 ₱ dox $1.00
Pierce's ₱ doz .88
Glass Cutters.—Combination Glass Cutter and Knife Sharpener ₱ dox $1.00
Grub Hoes.—K. P. & Co.'s No. 2, $11.50 ₱ doz. dis 50 & 10 %
Hammers.—Maydole's dis 15 %
Hartford Hammer Co dis 20 %
Hangers & Rollers.—Anti-Friction dis 50 %
Acme Rollers dis 50 %
Climax dis 50 %
Common Hangers dis 50&10 %
Common Rollers dis 50&10 %
Victor Hangers dis 50 %
Victor Rail dis 50 %
Hand Screws. dis 10 %
Hatchets.—C. F. Dowse, new list dis 35 %
Underhill dis 35 %
Hay Knives.—Lightning ₱ doz $18.00, net
Hinges.—Strap and T (new list) dis 65&10 %
Providence Plate ₱ ℔ 5¢
Wrought Screw Hook ₱ ℔ 5¢
Hoes.—Eastern Tool Co. dis 60&10 %
W. C. & Co.'s. dis 60 %
Hooks and Staples.—Brewers (new list) dis 70 %
Horse Nails.

No.	6	7	8	9	
Putnam Pointed	.24	.22	.21	.20	5&7 %
Bridgewater	.23	.21	.20	19.	30 %

Ice Cream Freezers.—Packer's, new list dis 50&10%
Knobs.—"Norwalk." New list dis 66⅔ %
Silver Glass dis 50&10 %
Silver Glass Bell Pulls dis 50&10 %
Lanterns.—Tubulars, No. 0 ₱ doz $7.50
Lawn Mowers.
Continental dis 40&10 %
Quaker City dis 40&10 %
National dis 50 %
Lead.—Sheet ₱ ℔ 7¢
Pipe ₱ ℔ 6½¢
Locks.—Norwalk dis 66⅔ %
Eagle Cabinet dis 40 %
Eagle Trunk dis 15 %
Mallory, Wheeler & Co. dis 66⅔ %
Manure Forks.—W. C. & Co. dis 60 %
Eastern Tool Co.'s dis 60 %
Mattocks.
K. P. & Co., Long Cutter, $16.00 ₱ dox. dis 50 & 10 %
K. P. & Co., Short Cutter, $15.50 ₱ dox. dis 50 & 10 %
K. P. & Co., Pick Cutter, $16.00 ₱ dox dis 50 & 10 %
Measuring Tapes.—Eddy's dis 20 %
Meat Cutters.—Miles' Challenge dis 30 %
Hale's (new list) dis 40&10 %
American dis 33⅓ %
Money Drawers.—Tucker's Alarm ₱ dox $22.50
Mouse Traps.—Delusion ₱ doz 1.25
Novelty ₱ doz
Nails. ₱ keg
Oilers.—Zinc and Tin dis 60 %
Brass and Copper dis 50 %
Ox Bows.—Extra finished and varnished dis 15 %
1¼ in., ₱ dos. pair $7.00 | 2 in., ₱ dos. pair $10.00
1¾ in., ₱ dos. pair 9.00 | 2¼ in., ₱ dos. pair 12.00
Paper.—Common Tarred Sheathing ₱ ℔ 1¾¢
Eagle Brand Tarred Sheathing ₱ ℔ 2 ¢
Common, Dry Sheathing ₱ ℔ 1¾¢
Eagle Brand Dry Sheathing ₱ ℔ 2¼¢
Picks.—K. P. & Co., Adze Eye, 5 to 6 ℔ $12.00. dis 50 & 10 %
K. P. & Co., Adze Eye, 6 to 7 ℔ $13.00. dis 50 & 10 %
Planes.
Auburn Tool Co., Bench dis 20 %
Auburn Tool Co., Fancy dis 15 %
Auburn Tool Co., English Iron dis 15 %
N. Y. Tool Co., Bench dis 25 %
Plated Ware.—Rogers & Bro. dis 50 %
Pliers.—Vom Cleff & Co.'s net list
Button's Wire Pliers dis 33⅓ %
Plumb & Levels.—Stanley R. & L. Co. dis 70&10 %
Potato Diggers.—W. C. & Co., reduced list. Eastern Tool Co.'s dis 60 %
Pulleys.—Acme or Excelsior, 1¾ in. ₱ dox 22¢
Acme or Excelsior, 2 in. ₱ dox 24¢
Pumps.—Union Manufacturing Co.
Iron Cistern dis 50 %
Iron Pitcher Spout dis 60 %
Copper dis 30 %
Rivets.—In 5 ℔ papers dis 45 %
Burrs dis 50 %
Copper dis 50 %
Razors.—Torrey's dis 20 %
Rules.—Stanley, Boxwood dis 75&10 %
Stanley, Ivory dis 50&10 %
Sad Irons.—Common ₱ ℔ 3¢
Laundry ₱ ℔ 6¾¢
Tailors' Geese ₱ ℔ 6 ¢
Enterprise "Potts" dis 33⅓ %
Sash Locks.—King & Hutchinson's, new list dis 40 %
Sandpaper.—Baeder & Adamson dis 40 %
Sash Weights.—Patent Eye ₱ ℔ 1½¢
Saws.—Hand Saws, Disston's dis 20 %
Cross-Cut Saws.
Disston's, Common Tooth ₱ foot 68¢, dis 45 %
Disston's Great American Tooth ₱ foot 68¢ dis 45 %
Boynton's Lightning Tooth ₱ foot 45¢
M. B. & D., Hand Saws dis 33⅓ %
Richardson Bros. dis 25 %
Saw Blades.—Disston dis 20 %
Welch & Griffith, Extra ₱ dos $7.20
Welch & Griffith, No. 2 ₱ dos 6.00
Scales.—Fairbanks dis 20 %
Screws.
Flat-Head Iron new list, dis 85 %
Flat-Head Brass new list, dis 86 %
Round-Head Brass new list, dis 83⅓ %
Round-Head Iron new list, dis 83⅓ %
Grilley Round-Head Nickel-Plated Common dis 60 %
Scythes.—Clippers, in boxes ₱ dos $6.00
Shaves.—Kimball's ₱ inch 75¢
Watrous dis 30 %
Shears.—American Shear Co., new list dis 70 %
Shot.—Le Roy ₱ ℔ 6¢
Shovels.—O. Ames, new list dis 20 %
O. Ames, other brands, new list dis 20 %
Sinks.—Magee Patent dis 30 %
Snow Shovels. $3.75
Skates.—Union dis 40 %
Union Roller dis 25 %
Stocks and Dies.—King's dis 10&5 %
Tacks.
Swedes Tinned dis 60&10 %
Swedes Iron dis 60&10 %
Gimp and Lace dis 60&10 %
Copper Tacks dis 55 %
Traps.—Oneida, Genuine dis 33⅓ %
Oneida, Imitation, H. & N. dis 60 %
Blake's dis 40&10 %
Vises.—Simpson's Adjustable dis 25&5 %
Howard Vise Co. dis 25 %
Prentiss' dis 30 %
Weather Strips.—Packer's. ₱ dos $4.50
Browne's Flexible Rubber dis 30 %
In 25 feet boxes: No. 1, ⅛ in. wide, ₱ yard, 10¢.
No. 2, ⅜ in., 15¢.; No. 3, ⅝ in., 20¢.; No. 4, 1 in., 25¢
Black Walnut Spring Weather Strips ₱ dos $3.50
Window Springs. dis 35 %
Babcock's No. 3 ₱ gross $0.25
Babcock's No. 4 ₱ gross 4.15
Wire Cloth.—"Clinton" ₱ sq. ft 2 ¢
Wire Fence.
Washburn Painted Barbed ₱ ℔ 4½¢
Washburn Galvanised Barbed ₱ ℔ 5 ¢
Wire Goods.—Gate Hooks & Eyes, &c. dis 70&10&10 %
Wrenches.—A. G. Coe's dis 60 %
Girard Mfg. Co dis 60&10 %
Girard Agt. dis 70&10 %
"Always Ready" dis 25 %
Wringers.
Novelty for Common Tubs No. 2—10-inch ₱ dos $27.00
" " " " No. 3—11-inch ₱ dos 31.50
Excelsior for Stationary Tubs No. E—10-inch ₱ dos 39.00
Excelsior for Stationary Tubs No. F 11-inch ₱ dos 43.50
Excelsior with Folding Bench No. A—10-inch ₱ dos 48.00
Excelsior with Folding Bench No. B—11-inch ₱ dos 52.50
Novelty Set Tub, E ₱ dos ....
Keystone, Wood Frame No. 1¼ ₱ dos ....
Keystone, Iron Frame No. 2¼ ₱ dos ....
Zinc ₱ ℔

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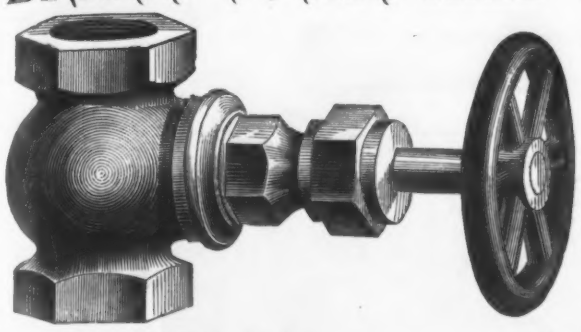

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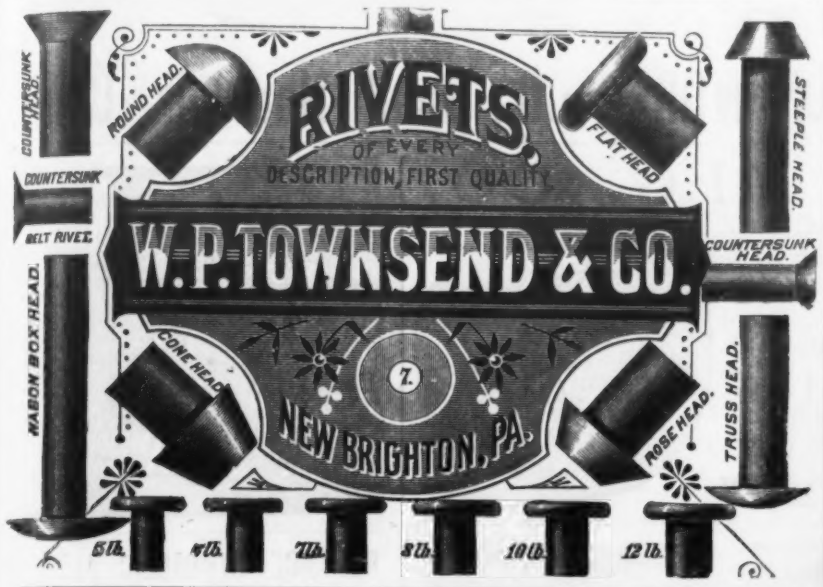

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SUITABLE FOR MACHINERY OF ALL KINDS.

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NORWAY IRON FANCY HEAD BOLTS.

Carriage & Tire Bolts, Star Axle Clips, &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa.

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Water Gas AND Steam Fitters Tools.

CATALOGUES AND PRICE LISTS FREE ON APPLICATION.

TENSILE STRAIN. } 56,000 to 64,000 lbs.
REDUCTION OF AREA—35 to 43 per cent.

CAPACITY. { Plates 1¼ inch thick to No. 14.
30 feet long.
70 inches wide.

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MANUFACTURERS OF

BOILER PLATE

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CHARCOAL BLOOMS.

Locomotive, Fire Box, Flange and Shell Iron; Plate for Bridges and Girders; Tank and Stack Iron; Boat Plate and Iron for Wrought Pipe; Plate Iron for Fire and Burglar-Proof Safes.

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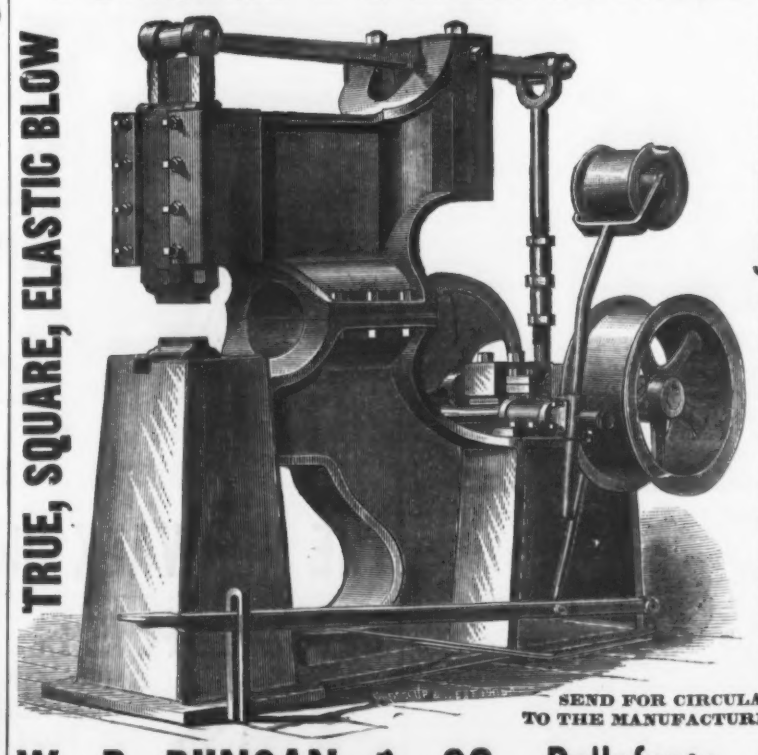
TRUE, SQUARE, ELASTIC BLOW

STEEL HELVE, RUBBER CUSHIONED



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MANUFACTURERS OF

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Special Machinery

FOR

Sheet Metal Workers.

259, 261 & 263 RANDOLPH ST.

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BROCK'S PATENT DROP FORGED CHAIN PIPE WRENCH.

MADE ENTIRELY OF BAR STEEL.

Six Sizes; adapted for Pipe from ⅛ to 14 inches diameter.

Each number will fit a range of sizes equal to six or more pairs of common tongs, while it will outwear an equal number of any kind.

All parts are interchangeable, and can be readily renewed.

Jaws are hardened to a saw temper, and can be sharpened with a file.

Does not crush pipe; has a quick grip; never slips; chain will not unhitch while in use, but can be instantly released.

J. H. WILLIAMS & CO.,

Manufacturers of Every Description of Iron and Steel Drop Forgings,

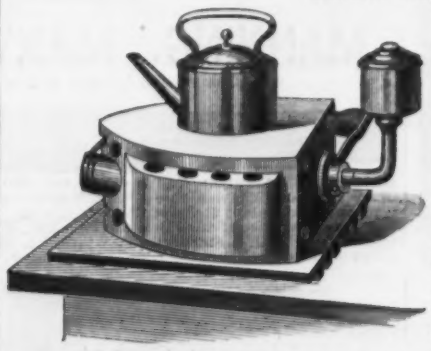
9 RICHARDS ST. (Near Hamilton Ferry), BROOKLYN, N. Y.

FOX SAD-IRON CO.,

78 MAIDEN LANE,

NEW YORK.

Awarded the only *Gold Medal* at the *New Orleans Exposition* over all Sad-Iron competitors.



Our Iron does away with Hot Kitchens.

Being reversible, one Iron does the work of an entire set (one side heats while the other is in use). It combines first-class Fluter and Polisher, also makes the best little Cooking Stove for a sick-room, &c., ever invented. Can be used with either Gas or Alcohol. Very simple and absolutely safe in handling.

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Polishing Wheels,

an essential requisite for all METAL WORKERS.

Supersedes the *Solid Wood* and *Leather Wheels*, and for many purposes the *Polishing Belt*. Acknowledged *superior to all others* where used. Manufactured by

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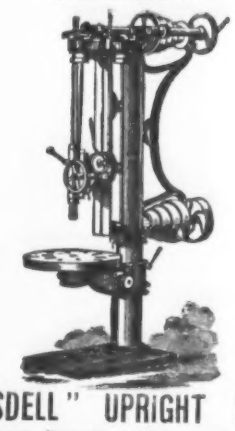

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Send for new Catalogue of Specialties.

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Many have done hard continuous duty 5 years without a single part being renewed. This is the key of our success. They have built up a reputation themselve that cannot be approache Our improved

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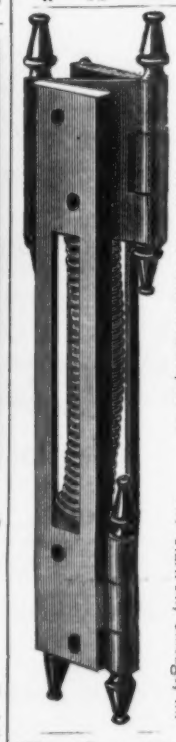

½ Pair Chicago Double-Acting Spring Butts.

LIST JAPANNED.

1	in.....per pair,		$1.20.
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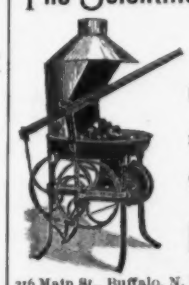

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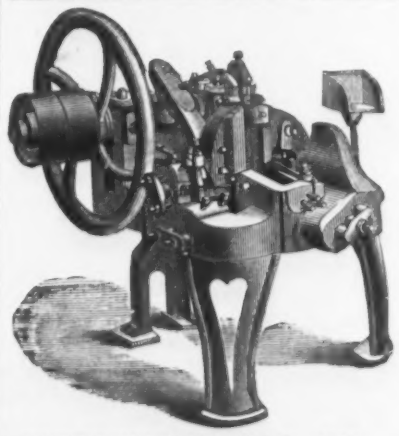

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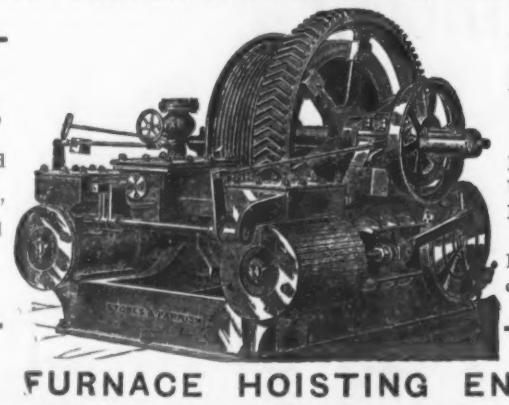

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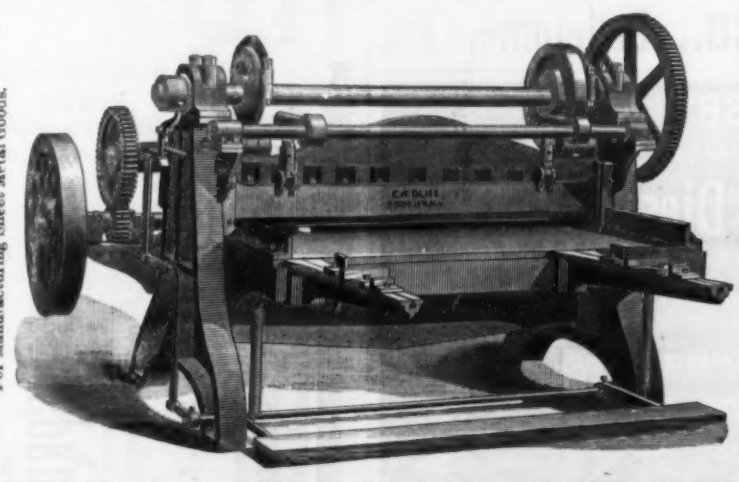

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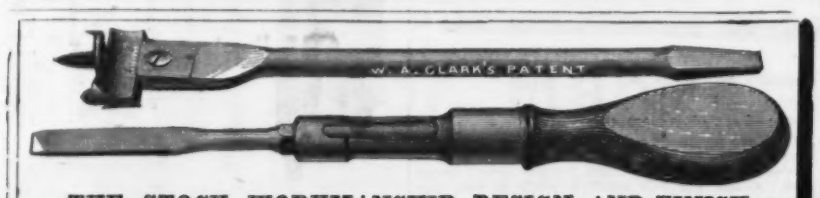

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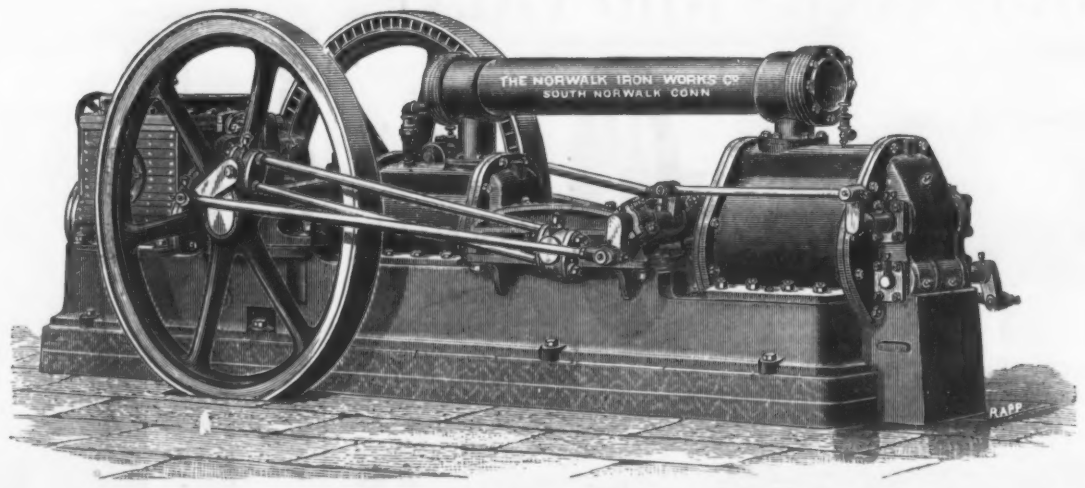

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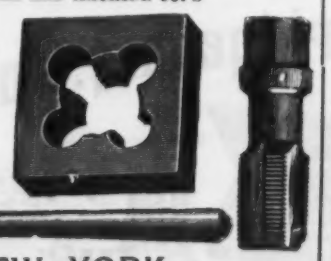

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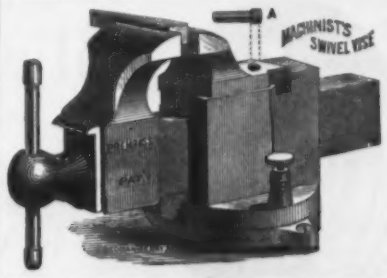

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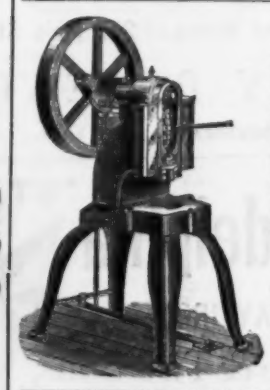

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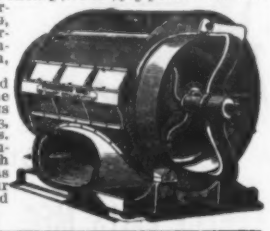

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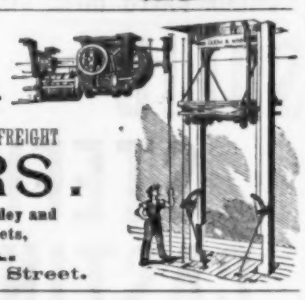

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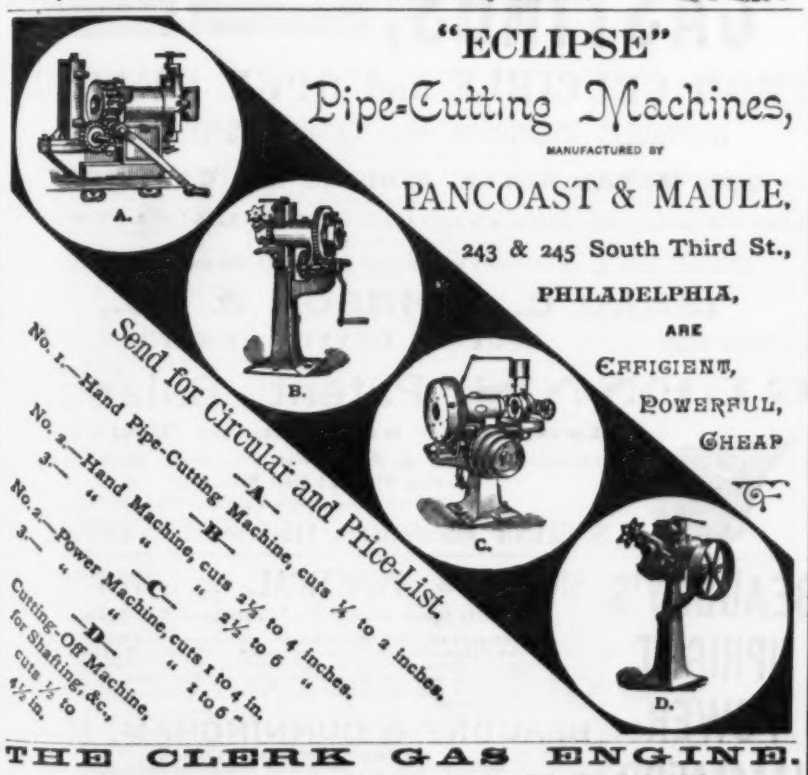

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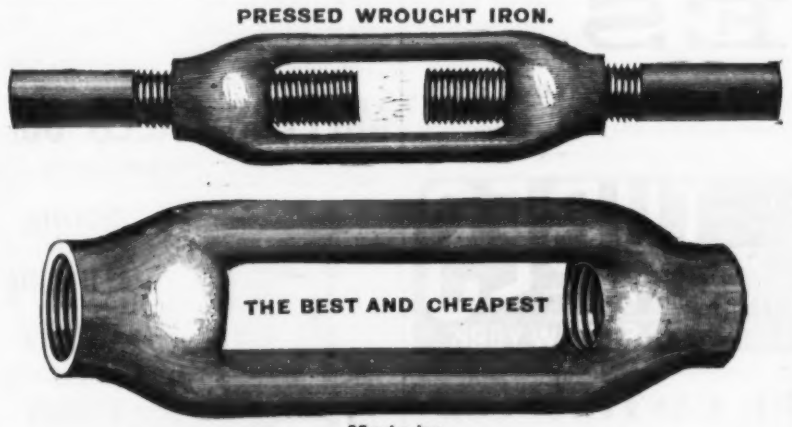

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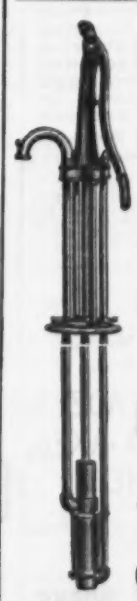

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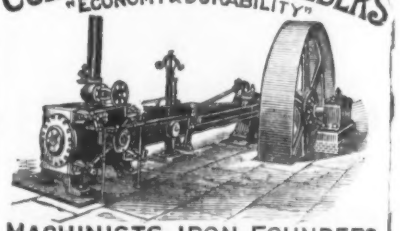

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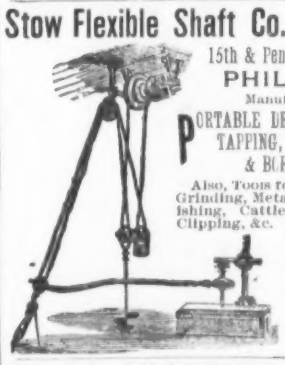

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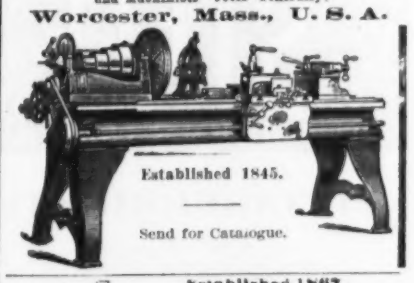

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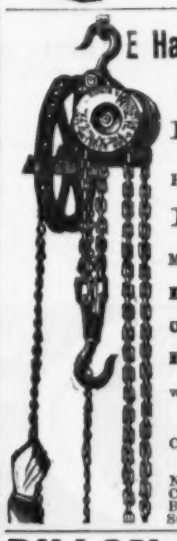

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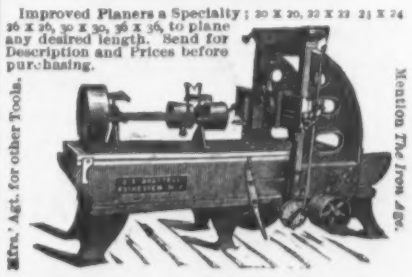

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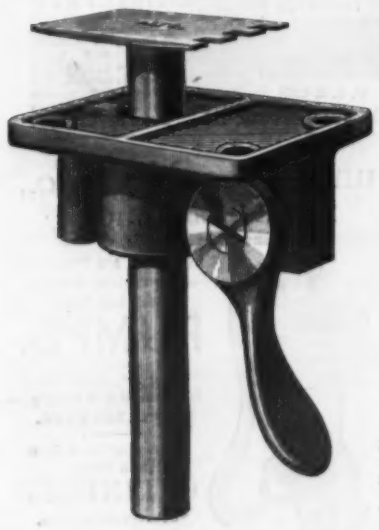

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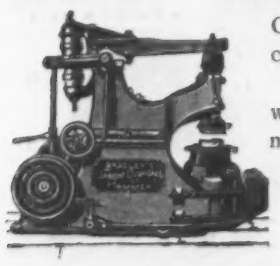

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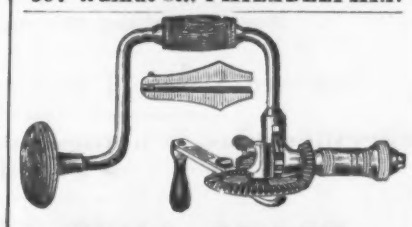

DRILL BRACE.

This is a 10-inch sweep Ratchet Bit Brace, with a gear wheel, speeded about three to one, to be used for drilling iron. When not needed for drilling, this gear wheel can be taken off in one second.

This Bit Brace is made of steel, highly polished and heavily nickel-plated with a cocobola handle and lignumvitæ head. It has two sets of forged steel jaws, which will hold square and flat shank tools of all shapes and sizes, and round twist drills from 7-16 to 1-32 inch in diameter. The ratchet attachment enables the Brace to be used in places where there is not room to revolve the sweep.

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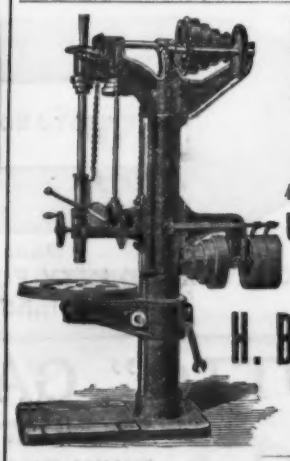

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(*From the Engineering and Mining Journal, Aug. 8, 1885.*)

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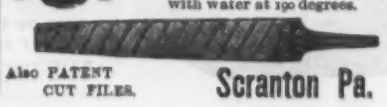

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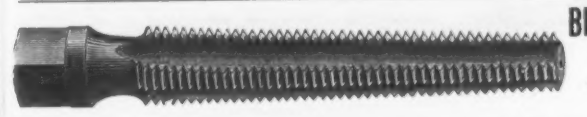

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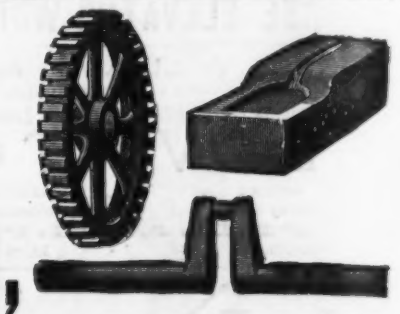

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